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Toward Labor Flexibility with Chinese Characteristics? The Case of the Chinese Construction Machinery Industry

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This paper takes an institutional perspective to study the roles of institutional change and continuity in shaping Chinese enterprises' labor flexibility strategies. Based on intensive field research in seven construction machinery enterprises, I find that employment practices in these workplaces are converging toward extremely numerical flexibility including the use of temporary labor, short-term labor contracts, termination of labor relationships, internal retrenchment and flexible working time. I argue that both institutional change and continuity have played important roles in shaping these labor flexibility practices. On the one hand, the changing household registration system, the changing social protection system, the establishment of the labor contract system, the weakening workers' representation in the workplace, and the ambiguous labor regulations and weak enforcement have directly provided pre-conditions for the spread of extreme numerical flexibility practices in the Chinese workplace. On the other hand, the continuity of other institutions including the macroeconomic control of the state, the underdeveloped business credit system, the cultural preference of extremely short lead time, and the vocational education and training system has indirectly imposed imperatives of extreme numerical flexibility on these enterprises by increasing uncertainties and fluctuations of product markets and worsening the labor market condition of excess low skilled and scarce high skilled labor.

Introduction

Social, economic, and political changes in the past three decades have dramatically transformed the workplaces in advanced industrial nations (e.g. Appelbaum and Batt, 1994; Katz and Darbishire 2000; Kochan, Katz, and McKersie 1986; Locke 1996; Locke, Kochan, and Piore 1995; Streeck 1988; Swenson 1989, and Wood 1989). In particular, flexibility has become a new frontier of managing work and employment (e.g. Cappelli and Neumark 2004; Atkinson 1984; Atkinson and Nigel 1986; Grenier, Giles, and Belanger 1997; Lorenz 1992; Osterman 1994; Penn, Lilja, and Scattergood 1992; and Pinfield and Atkinson 1988).¹ To adapt quickly to rapid developments in technology, greater diversity in labor markets, and increasing international competition in product markets, firms have developed two primary flexibility strategies: numerical (or external) flexibility that aims at reducing costs by adjusting the quantity or volume of labor, and functional (or internal) flexibility that aims at improving performance by enhancing employees' ability to perform a variety of jobs and participate in decision-making (Atkinson 1984; OECD 1986). While numerical flexibility includes the use of temporary and contract labor, subcontracting, short-term contracts, layoffs, retrenchment, shift working, variable working time, and other practices which reduce employment security and the number of workers, functional flexibility usually involves teamwork, job rotation, multiskilling, work in multi-tasks and multi-sites, and pay for performance.² Although the exact relationship between the two flexibility strategies is still not clear (Cappelli and Neumark 2004; Kalleberg 2001), many studies suggest that firms are

¹ Flexibility can be defined in very different ways and at different levels. In this paper I focus on labor flexibility at the level of firm or establishment.

² Some researchers suggest financial or wage flexibility as the third type of flexibility (e.g. Atkinson 1984). However, this paper follows Kuruvilla and Erickson's (2002) perspective that views the use of pay as a key component of functional flexibility.

often simultaneously seeking for both of the flexibilities especially when their employees are divided into different groups (e.g. Cully et al. 1999; Grenier et al. 1997; Kalleberg 2003; Pinfield and Atkinson 1988; Streeck 1988; and Voudouris 2007). Yet, functional flexibility which shares characteristics with high performance work systems, seems to have gained more currency in the Western workplaces since the 1990s (e.g. Appelbaum and Batt, 1994; Applebaum et al. 2000; Godard and Delaney 2000; MacDuffie 1995; Osterman 1994, 2000; and Wood 1999).

The search for flexibility has spread to workplaces in developing countries in Asia (e.g. Kuruvilla and Erickson 2002), Latin America (e.g. Cook 1998), and Africa (e.g. Horwitz 1995). According to the renewed convergence hypothesis, powerful forces of globalization and international competition are driving employment practices all over the world converging toward international “best practices”(e.g. Kochan, Lansbury and MacDuffie 1997; Krugman, 1996; Streeck, 1997; Womack, Jones and Roos 1990). The divergence approach, however, argues that deep-rooted differences in country’s institutional arrangements lead to varied effects of globalization across countries which makes world-wide convergence of employment practices unlikely (e.g. Hall and Soskice 2001; Whitley 2000).

Both of the perspectives have been taken in the study of the changing Chinese workplace. China’s increasing integration into the global economy, the rapid growth of foreign direct investment, and the diffusing role of multinational companies make some researchers believe that there is a trend of convergence in terms of employment practices in the Chinese workplace, although they often disagree on the extent or direction of such convergence (e.g. Benson and Zhu 1999; Björkman 2002; Chan 1995a; Chile and Tse 2001;

Cooke 2005a; Gallagher 2005; Kuruvilla and Erickson 2002; Warner 1996, 2000, 2003). Some researchers, however, are more cautious about the convergence thesis highlighting the great variance of employment patterns in different regions, industrial sectors, and companies with different ownerships (e.g. Chan 1995b; Ding, Goodall, and Warner 2000; Taylor 1999). In particular, whether or not ownership boundaries of employment practices are disappearing has become the focus of the debate (e.g. Ding et al. 2000; Gallagher 2005; Gong and Chang 2008; Law, Tse, and Zhou. 2003; Wang, Bruning, and Peng 2007; Zhu and Dowling, 2002; Zhu et al. 2005).

Yet, most of the convergence/divergence debate in China focuses on Western standard human resource policies and practices, while lacking systematical examination of labor flexibility in the workplace. Nonetheless, the existing studies do suggest that the Chinese workplace is becoming more flexible (e.g. Benson et al. 2000; Bodmer 2002; Chen 2001; Kuruvilla and Erickson 2002), but the focus seems to be on cost-based rather than value-added strategy (e.g. Benson et al. 2000; Chen 2001; Zhao and Nichols 1996). My field research in China in the past three years finds that there is widespread adoption of extreme numerical flexibility by different types of Chinese enterprises, while the diffusion of functional flexibility is in a piecemeal manner and much slower. The selective (or sequential) adoption of numerical flexibility over functional flexibility instead of complete convergence toward the international “best practices” (i.e. both numerical and functional flexibility), according to Kuruvilla and Erickson (2002), is due to the nature of the development of competitive advantage. Since presently competitive advantage of Chinese enterprises is mainly based on low costs, numerical flexibility thus tends to predominate. This strategic

perspective seems valid, but it tends to overlook significant constraints imposed by institutions and markets that may hinder or enhance different types of flexibility. For instance, powerful industrial relations institutions (such as labor law and trade unions) may prevent the use of many numerical flexibility practices; and increasing uncertainty and fluctuation of product markets may force companies that compete on the basis of high quality, productivity, and skills to adopt numerical flexibility practices such as layoffs and the use of contract labor.

This chapter therefore takes an institutional perspective to study the roles of institutional change and continuity in shaping Chinese enterprises' labor flexibility strategies. Through institutional lens the roles of markets are also examined.³ Institutionalists usually emphasize difficulty or slowness of institution change, with an implicit assumption of the existence of a democratic polity in which policy decisions are the result of negotiations among a multitude of diverse actors pursuing specific vested interests. However, China maintains the communist authoritarian regime, in which the complex and unpredictable political process is not considered in institutional analyses in the West. In fact China's market transition under the leadership of the Party-state has led to both rapid changes of some institutions and continuity of others. Based on my field research, I argue that both institutional change and continuity have played important roles in "selecting" numerical over functional flexibility. On the one hand, the changing household registration system, the changing social protection system, the establishment of the labor contract system, the weakening workers' representation in the workplace, and the ambiguous labor regulations and weak enforcement have directly provided pre-conditions for the spread of extreme numerical flexibility practices in the

³ Following Whitley (1992, 2000), culture preferences and beliefs are viewed as institutions in this paper.

Chinese workplace. On the other hand, the continuity of other institutions including the macroeconomic control of the state, the underdeveloped business credit system, the cultural preference of extremely short lead time, and the vocational education and training system has indirectly imposed imperatives of extreme numerical flexibility on Chinese enterprises by increasing uncertainties and fluctuations of product markets and worsening the labor market condition of excess low skilled and scarce high skilled labor.

This study contributes to the literature in the following ways. First, with empirical evidence of “selective” convergence of employment practices toward numerical flexibility with Chinese characteristics, this study calls for a more nuanced analysis of convergence. Due to various institutional constraints, partial rather than complete convergence toward international “best practices” seems more likely. Second, the literature of varieties of capitalism mainly focuses on advanced industrial nations while little research has been done in transitioning and developing economies. This study, by examining the impacts of Chinese institutions on employment practices, extends the analyses of varieties of capitalism to a statist market economy which is significantly different from the models set forth by Hall and Soskice (2001) and Amable (2003). Finally, this study also contributes to the above-mentioned ownership debate in the field of Chinese industrial relations and human resource management. By comparing employment practices in the theoretically sampled enterprises, this paper suggests that ownership differences are gradually disappearing at least in terms of numerical flexibility.

Research Methodology

This study is based on my field research in the summer of 2006 and 2007 in seven

enterprises in the construction machinery industry in Xuzhou, Jiangsu province. Xuzhou is a medium sized industrial city with GDP per capita US \$2,528 in 2007, 24.3% and 29.4% of that of Shenzhen and Shanghai respectively.⁴ While most studies have been conducted in Shanghai, Shenzhen, or other coast cities, focusing on a second-tier city may better reveal the extent of workplace changes in China.

China's construction machinery industry started from scratch in the 1950s and became a "free competition" heavy industry without entry barriers (which is different from the auto industry) in the 1990s. Sales revenue of this industry reached US \$ 30 billion in 2007, ranking the second place in the world just after the United States. By the end of 2005, there were about 2,000 enterprises (10% are foreign invested) in this industry with total employment of 330,000 workers.⁵ Most of these enterprises concentrate in six construction machinery industrial districts, among which Xuzhou is the largest one.⁶ Presently there are over 100 construction machinery enterprises in Xuzhou, including state-owned enterprises (SOEs), private-owned enterprises (POEs), international joint ventures (IJVs), and wholly foreign-invested enterprises (WFIEs). All construction machinery enterprises in Xuzhou were state- or collective-owned and affiliated to Xuzhou Machinery Industry Bureau in the command economy. With the progress of enterprise reform, some surviving enterprises have gained complete autonomy through privatization. Others, although still affiliated to a state group company established in 1989 (which takes many functions of the former local machinery industry bureau), have gained high operational, financial, and personnel autonomy

⁴ Calculations were based on the data from Statistical Bureaus of Xuzhou, Shenzhen, and Shanghai.

⁵ Source: China Construction Machinery Industry Association (CCMIA).

⁶ Total sales revenue of construction machinery enterprises in Xuzhou accounted for one third of that of the whole national industry in 2005.

through various corporate restructuring.⁷ There are also some newly established construction machinery enterprises in Xuzhou, but the majority of them are very small POEs producing parts and components.

The seven enterprises chosen for this study are among the largest ones in the local construction machinery industry. A, B, and D even capture the largest national market shares of their major products respectively. Workers in these enterprises are often envied by the local people given their relatively high and stable salary. Six of these enterprises have both parts and final assembly sub-plants while E only produces parts and components. A, C, D, and E were founded in the early days of socialist industrialization, while B, F, and G have a much shorter history. The ownerships of these enterprises vary, including two SOEs, two listed SOEs, a Sino-US joint venture, a wholly German-owned enterprise, and a POE (see table 1 for the profiles of these enterprises). This sampling method allows a better examination of the effect of ownership on employment practices since industry and location factors are largely controlled.

Insert Table 1 about here

Each case study involved interviews with the general and/or vice-general manager, managers of all functional departments (including human resource, manufacturing, technology, marketing, purchasing, quality control, and finance) and sub-plants/workshops, and union chairman and/or vice-chairman, shopfloor visits and informal talks with front-line workers, collection of enterprise documents and data, and surveys on workers' perceived

⁷ For details about China's state group companies see e.g. Ma and Lu (2005) and Sutherland (2003).

employment practices and evaluation of their trade unions.⁸ The surveys were done in a way similar to structured interviews. In each enterprise, I randomly chose workers from the employee list of the assembly sub-plant/workshop (the number of selected workers ranged from 22 to 56) and asked the manager to call in these workers to a conference room to fill in the questionnaires during working time.⁹ To ensure the quality of the survey, I asked the manager to leave the room, assured the workers complete confidentiality of their answers, explained the survey questions, and provided small cash rewards to some workers randomly chosen from those who had answered all the questions. In total I conducted over 90 interviews and received 264 usable survey questionnaires.

The Changing Employment Practices in the Chinese Industrial Workplace: Evidence from Case-Study Enterprises

Industrial production in China from the mid-1950s to the early 1990s was dominated by SOEs, which was not organized to make profits, but to fulfill the economic and social policy of the state (Walder 1986). The Chinese socialist employment system, characterized by the so-called “iron rice bowl” (*tie fan wan*), was rigid and inflexible resulting in dramatic over-manning, low work morale, and poor performance in most SOEs (Child 1994; Korzec 1992; Takahara 1992; Walder 1986). Employees were allocated to their work units (*danwei*) by local labor bureaus according to state plan, after which they usually enjoyed lifetime employment and cradle-to-grave welfare (Child 1994; Ding and Warner 2001; Walder 1986; Warner 1987, 1995). Dismissals which required permissions of local industrial bureaus were

⁸ The surveys used in this paper were a part of larger surveys which involved both workers and engineers, and had additional questions regarding organizational trust and commitment, turnover intention, discretionary behavior, etc..

⁹ The workers surveyed in E were from parts assembly lines.

rare; and often due to criminal behavior or political dissidence rather than poor work performance. Layoffs did occur, but only in rare cases of enterprise disbandment or temporary closure (Walder 1986: 72-3). Labor mobility between enterprises and regions was uncommon too, hindered by numerous institutional barriers, for example, the household registration (*hukou*) system that only permitted workers to be permanently employed in their area of residence (Walder 1986: 69-71). For various reasons, however, temporary workers were used but mainly in public works projects, construction, and road-building (for details see Walder 1986: 49-54). In manufacturing enterprises, as several managers in A, C, and D recalled, there were only a very small number of temporary workers engaging in heavy labor such as construction work and moving and hauling. Occasionally, workers also needed to work overtime (with no extra pay or very small supplements) especially during production campaigns. However, according to some old workers I interviewed, workers often volunteered to work overtime to either fulfill their political responsibility or to become activists or “model workers”. This is consistent with Walder’s (1986: 149) findings. In general, enterprises did not have the autonomy to hire or fire workers, nor did they force workers to work overtime. Thus, although temporary workers, layoffs, and overtime existed before the economic reform, numerically flexibility in the Chinese workplace was extremely limited.

Chinese enterprises also significantly lacked functional flexibility in the pre-reform era. Wage systems in Chinese industries were directly administered by the central government that set the general wage policies and determined both the wage structure and differentials. Although piece rates and bonus systems were widely adopted in the 1950s (Takahara 1992;

Walder 1986), they were criticized as “anti-socialist” in political campaigns and abolished during the Cultural Revolution of 1967-1977 (Yuan 1990). Thus, the formal link between wages, individual performance, and enterprise profitability was largely missing in the Chinese workplace when the economic reform launched in 1978. Yet, enterprises did achieve certain functional flexibility in terms of work organization through the work group (*shengchan xiaozu*) system, which “was not only a structural innovation, but also an attempt to develop a more effective means of motivating workers.....” (Walder 1986: 111) A work group was the basic production unit in the Chinese workplace, which usually had no more than a dozen workers, led by a worker designated (by the workshop director and party branch secretary) as the group leader.¹⁰ The work group-based production used to involve a lot of communication, cooperation, and participation (especially through various production and discussion meetings), and require workers to perform a broad range of tasks including technical jobs, statistical reporting and accounting, routine inspection, and paper work (Walder 1986). According to some assembly sub-plant/workshop managers and old workers in A, C, D, and E, the assembly work before the 1990s, which was called “stall assembly” (*ditanshi zhuangpei*, literally translated), was done in a cooperative way by groups of workers. Although the efficiency was very low due to poor technology and equipments, workers could gain more skills through teamwork. However, for some reasons especially the abolishment of group bonus system during the Culture Revolution, work groups became dysfunctional and ineffective in the 1970s (for details see Walder 1986). The traditional socialist workplace also actively solicited workers’ participation through the “raising rational suggestions” (*ti helihua*

¹⁰ Production in the Chinese industrial workplace was usually organized at three levels: workshop, work section (*gongduan*), and work group.

jianyi) system. Yet, due to the problems of nonmaterial incentives, the participation practices were characterized by strong formalism (Chan 1997).

The traditional Chinese industrial workplace has dramatically changed since the economic reform. As to the case-study enterprises, the most striking change in terms of employment practices is the breakdown of the “iron rice bowl” system and following predominance of extreme numerical flexibility. The various numerical flexibility practices adopted by these enterprises are summarized in Table 2 and Table 3 and examined in detail in the following section. It should be noted that the employment data in Table 2 come from 2006, which cannot reflect the large scale downsizing in the late 1990s and early 2000s; and that the data in Table 3 are based on interviews and surveys in the assembly sub-plants/workshops which, compared to other sub-plants/workshops in the same enterprises, have more advanced technology, equipments, and skilled workers, and adopt less numerical flexibility practices.

Insert Table 2 and Table 3 about here

Use of Temporary Labor Five different types of temporary labor were found in these enterprises. The first type was local peasant workers who were employed directly by the enterprises or sub-plants/workshops through the labor bureau, labor market, or internal recommendations. These workers engaged in a variety of jobs including heavy labor, auxiliary work, parts production, and assembly work. According to the labor law, their employment should also be based on contracts. However, while A, B, D, and E gave these workers three- or six-month contracts, C, F, and G did not sign labor contracts with them. Interestingly, such practice was not allowed in C according to its formal employment policy,

but widely found in its sub-plants where the managers had the autonomy to directly hire these workers. In a sub-plant of C, such workers even accounted for over half of its total workforce. Compared to formal contract workers, these temporary workers were usually given lower wages, reduced benefits and social insurance, or no benefits and insurance at all if they did not have labor contracts.

The second type was dispatched labor (including both peasant and urban workers) hired by these enterprises through labor service companies (which signed contracts with the workers). These dispatched workers often worked in the front-line, but received much lower wages. Although reduced social insurance was paid by the enterprises to the labor service companies, the latter seldom gave it to the workers.¹¹

The third type was apprenticeship labor, i.e. young graduates of technical schools (the majority of which were from rural area) who entered these enterprises after graduation, worked in the shopfloor without labor contracts, and received reduced wages or only basic living allowance.¹² Although the labor law states that apprentice period should be no more than six months, the actual apprenticeship in all of these enterprises was at least one year. In C and F many workers had worked as apprenticeship labor for two or three years. Even worse, because receiving a labor contract is not legally required once apprenticeship ends, technical school graduates were in fact employed “at will” and to some extent “recycled” by these enterprises.

The fourth type was interns from technical schools who were still students in status.

¹¹ Interviews with HR managers of the seven enterprises. The fact was well known by all of them.

¹² Apprenticeship workers were used in SOEs before the economic reform, see Frazier (2002: 198) and Walder (1986). However, apprenticeship was required only for unskilled labor. Graduates of technical schools were guaranteed employment in SOEs and did not need to go through the apprentice period (Walder 1986: 58-9).

Because practical skill training was far from enough in the technical schools, students wanted to learn skills in factories and gain some working experience. Technical schools also encouraged students to intern, and often assigned students to enterprises under their requests. The normal internship was one year, although it could be shorter. These interns usually worked as assistants of their “mentors”, doing some auxiliary work. Because no pay was required for these interns, only several sub-plants/workshops in these enterprises paid a small amount of subsidies to them (about US\$ 1.25 per work day). According to a sub-plant manager in C, “although they do not have enough skills to work independently, we really need them especially in peak seasons.....and we do not need to pay them.”

The last category of temporary labor was external, i.e. workers in small subcontracting enterprises or special service companies. All of the seven enterprises subcontracted some services such as security, cleaning, and dining to special service companies. They also subcontracted some parts production or work processes to small POEs (many of them had less than 30 workers) in which labor costs were much lower due to the prevalence of various illegal employment practices. Yet given different enterprise sizes, the number of subcontractors varied ranging from fifty to over two hundred. In addition, while most subcontracting was permanent, some was temporary, i.e. only in peak seasons.

The five types of temporary workers were found in all the enterprises, although the percentage of each category differed across enterprises and even sub-plants/workshops. Table 3 shows that the first two types of temporary labor did not exist in the assembly sub-plants of A, B, and D, but they were found in other sub-plants of these enterprises. The wide use of technical school graduates/students as extremely low-paid or even free temporary workers is

particularly worth noting. All the enterprises viewed technical school graduates/students as an important reserve of cheap, disciplined, and well-trained (compared to unskilled peasant workers) temporary labor. They had close relationships with local technical schools, and could always get the graduates/students when they were needed.¹³ The technical school graduates/students in the assembly workshop of G, a relatively new POE, even accounted for 60.2% of the total workforce.

Short-Term Contracts Instead of life-time employment, all formal staff and workers in these enterprises were employed on a contractual basis which made dismissals much easier. Although a few senior employees and core technical talents were given ten-year or open-ended contracts, short-term (equal or less than three years) contracts were widely used in these enterprises especially for production workers. Table 3 shows that except for B and D, all the other enterprises gave over half of their assembly workers short-term contracts. F, a German-owned enterprise, even signed short-term contracts with almost all its assembly workers. The contracts for new workers were even shorter, usually one year in all the enterprises. Managerial positions, however, usually had three-year or five-year labor contracts, which, although a little longer than workers' contracts, could also be terminated due to their poor performance or enterprise restructuring.

Termination of Labor Relationships Termination of labor relationships in these enterprises had three categories. The first was enterprise-proposed termination before the labor contracts expired (i.e. dismissal). Although a very small number of workers fell into this category each year due to criminal behavior or extremely poor performance, these

¹³ Interviews with HR managers of these enterprises.

enterprises especially the SOEs were often reluctant to do so for various reasons such as the socialist tradition, possible labor disputes and conflicts, workers' petition to the government, and even personal harassment or attack.¹⁴ However, large scale dismissals did happen when the enterprises faced sharply declined market demands and financial losses. For instance, both E and G dismissed over 200 workers in 2004 due to poor economic performance.¹⁵ While it was still not very common to dismiss workers in these enterprises, managers were able to wash out the workers whom they did not want by choosing another two ways to terminate workers' labor relationships. One was "forced" employee-proposed termination before the labor contracts expired, which was found in the four SOEs. Through enterprise restructuring, the "re-application for posts on a competitive basis" (*jingzheng shanggang*) system, and the "elimination of the last" (*mowei taotai*) system, redundant or poorly performing workers were transferred to the enterprise labor pools waiting for posts.¹⁶ If they could not find a position within six months or they could not fit the new position (usually related to heavy labor or unhealthy jobs) offered by the enterprises, the enterprises had the "right" to dismiss them according to internal policies. Worrying that they might be compensated less if they were dismissed, these workers often chose to "voluntarily" terminate their labor contracts to get better negotiated compensation. Voluntary turnover also fell into the category of employee-proposed termination. But it was usually chosen by a few

¹⁴ Interviews with HR managers of these enterprises. After dismissed, workers in POEs, IJVs, and FIEs often filed labor lawsuits while workers in SOEs often visited or wrote letters to the government to complain or harassed or even violently attacked the managers.

¹⁵ Interviews with the HR managers of E and G.

¹⁶ The "re-application for posts on a competitive basis" system and the "elimination of the last" system were adopted by the four SOEs for the purposes of downsizing and pushing employees to work hard. While the former mainly applied to managerial positions, the primary target of the latter was production workers.

managers, engineers, and high skilled workers, the majority production workers wanted to stay rather than leave their enterprises.¹⁷ The other type of termination of labor relationships was natural termination (i.e. expiration or the emergence of the conditions for the termination as agreed upon by the parties involved in the contract) of labor contracts without renewal, which was commonly used by all of the enterprises. Short-term contracts further facilitated this practice. Table 2 shows the percentages of employees in these enterprises whose labor contracts were terminated in 2006 (the data provided by the enterprises did not distinguish different types of termination). The four SOEs had much lower termination rates, which reflected the remaining constraints in SOEs on firing workers.¹⁸

Internal Retrenchment Since radical downsizing (i.e. termination of labor relationships) was not easy for the four SOEs, they turned to various internal retrenchment practices to get out of redundant and poorly performing workers. The large-scale internal labor retrenchment in these SOEs started in the late 1990s and ended in the early 2000s. While some internal retrenchment practices in the 1990s such as “stop salary, keep post” (*tingxin liuzhi*), “don’t call us and we won’t call you” (*liang bu zhao*, loosely translated), and “leave post, keep labor relationships” (*ligang guabian*) either discontinued or were not allowed anymore when this study was done during 2006-2007, others remained or changed forms.¹⁹ In addition, the scale of internal retrenchment was still striking in the SOEs, albeit

¹⁷ According to HR managers of these enterprises, the voluntary turnover rates were very low, usually less than 3%. My survey also showed that the average turnover intention of assembly workers in these enterprises was 3.39/7, and only 6.9% showed clear turnover intention (the score was equal or higher than 5/7).

¹⁸ It is less possible that the lower termination rates in the SOEs were due to lower voluntary turnover rates since the latter was lower than 3% in all of the enterprises.

¹⁹ For details of the internal retrenchment practices in the 1990s see Gallagher (2005: 72-3) and Hassard, Morris, Sheehan, and Xiao (2006).

not as much as several years ago. The employment data provided by these enterprises (see table 2) indicated three categories of workers who were “off-post” (*ligang*) but kept their labor relationships with these enterprises: layoffs (*xiagang*), employees waiting for posts in the enterprise labor pool (*laodongli zhongxin daigang*), and early or internal retirement (*neibu tuiyang*, or *neitui*). From 1998 to 2005, a large number of elderly and low skilled workers in the four SOEs were laid off, receiving a small amount of monthly living allowance from the enterprises. However, by 2006 most of them had either changed their status to retirement or were forced to terminate their labor relationships with these enterprises (certain compensation were paid). Moreover, the layoff policy was officially abandoned in China in 2006. Therefore, the percentages of accumulated layoffs in these SOEs shown in Table 2 were small. However, significant percentages of production workers in these enterprises had laid-off experience. As indicated in Table 3, except for D which was very profitable from 1998 to 2003, the percentages of assembly workers who had experienced laid-off in the other six enterprises ranged from 2.3% to 38.7%.²⁰

While layoff “disappeared”, the four SOEs adopted an alternative form i.e. waiting for posts in the enterprise labor pool. Redundant or poorly performing employees were required to leave their positions and register in the enterprise labor pool receiving a small amount of living allowance. The enterprises regularly provided these employees training in some skills that were needed and redeployed them to new positions (often related with heavy labor or unhealthy operations). Alternatively, these employees could apply for vacancies within their enterprises on their own. If no positions were found within six months, these employees

²⁰ Workers in E, F, and G experienced laid-off because these enterprises were or had been joint ventures or SOEs.

would be dismissed. In 2006, C and D had 1.4% and 3.4% of their employees in the labor pools respectively (see table 2). A and B, however, due to increasing product market demands and profits, did not have workers entering the labor pools.

Another widely used internal retrenchment practice was early retirement, which was firstly introduced in China in 1993. According to the policy of these enterprises, female employees over 40 years old and male employees over 45 years old could apply for early retirement; and reduced wages (in some cases lower than the local minimum wage) and social insurances were paid for early retirees until formal retirement.²¹ The age limitation had become stricter in recent years (because the former policy was contradictory to the national regulation, which will be further discussed later): only employees who would reach the formal retirement age (50 for female workers, 55 for female staff, and 60 for male employees) within five years or who had worked over 30 years were eligible for early retirement. While a few employees voluntarily chose early retirement for some reasons such as they could make more money by taking other jobs or opening their own businesses, and they really wanted to have a rest due to health problems, most early retirees were in fact “induced” or “threatened” by the enterprises.²² Table 2 shows that except for F, all the other six enterprises had certain percentages of early retirees, ranging from 2.3% to 36.4%.

It is worth noting that in these enterprises managerial and administrative staff had become more vulnerable to internal retrenchment than workers in recent years. In the summer

²¹ If employees really wanted early retirement, the age limitation could even be loosed, for example, through sick retirement (*bingtui*).

²² This was admitted by HR managers of B, C, and D. In a few cases, lump sum compensations (usually between US\$1,250 and 2,500) were paid as an “inducement”. In most cases, however, many employees reluctantly retired early due to their fear of dismissals.

of 2007, both C and D downsized over 150 managerial and administrative staff (some workers in D were also retrenched, but less than managerial staff) through early retirement and waiting for posts in the labor pools. Failing to secure his position through “re-application for posts on a competitive basis”, the HR manager of C was also retrenched to the labor pool which had been under his leadership, though he got a managerial job in a POE very soon.

Flexible Working Time Perhaps the most salient numerical flexibility practice in the seven enterprises was flexible working time, which included shift work, overtime, job sharing, and working in reduced time. Table 3 indicates the prevalence of shift work in these enterprises. While shift work (*lunbanzhi*) was not new, two shifts work that better allowed overtime had replaced three shifts in these enterprises. Further, overtime had become routine. The labor law regulates that overtime cannot exceed 36 hours per month. However, as indicated in Table 3, assembly workers’ average monthly overtime in the past year was more than 36 hours in all of the enterprises except for D which had excess production capacity due to the shrinking market demands. The average overtime in peak seasons was more shocking, reaching 99.6 hours per month in B and 110.3 hours per month in C. Even in D, the average overtime in peak seasons was much more than the upper limit stated by the labor law. Due to rapid increasing market demands for products of A, B, and F, many workers there had worked two shifts (8am to 8pm and 8pm to 8am respectively) without weekends for over a year. Managerial staff also worked overtime, although not as much as production workers. In A, B, C, D, and F, middle and top level management were required to work six days and six and a half days a week respectively. Even worse, overtime were not paid in A, B, C, D, and F.

Instead, workers were given more rest days in slack seasons to compensate.²³ Yet, still many overtime hours were not compensated in this way. In particular, A and B had not experienced slack seasons in recent years. Although workers there made more money through the piece rate system, they were too exhausted and did not have time to spend money.²⁴ E and F, however, did pay overtime after deducting extra rest hours in slack seasons, which indicated that Western IJVs and WFIEs did better in implementing the labor law than Chinese domestic enterprises. While workers worked overtime when market demands were high, they shared jobs and worked in reduced time in slack seasons. Significant percentages of workers had experience of job sharing and working in reduced time in all of the enterprises as shown in Table 3. Wages were reduced when workers worked less time, but the local minimum wage was usually guaranteed in all of the enterprises.²⁵ However, according to some sub-plant managers, such “generous” guarantee in fact came from workers’ salaries in peak seasons, a part of which were withheld to pay workers in slack seasons.

In sum, extreme numerical flexibility was prevalent in these case-study enterprises. Although it is not surprising that the two listed SOEs did not differ from the two SOEs in employment practices, the convergence toward numerical flexibility in these enterprises indicates the blurring ownership boundaries. While the four SOEs still had difficulties in firing workers, various internal retrenchment practices were adopted to streamline these enterprises. For instance, only 0.4% of employees in D were terminated labor relationships in

²³ With the permission of local labor bureaus, enterprises can calculate workers’ working time on a whole year base, which is so-called “integratively calculating working time” (*zonghe jisuan gongshi*).

²⁴ In 2006 the average wages of A and B were US \$ 441 and US \$ 322 respectively, while the local average wage was US \$228.

²⁵ From the payroll I found that some workers’ wages were lower than the local minimum wage due to various penalties.

2006, but 41.1% were downsized through layoffs, waiting for posts in the labor pool, and early retirement (see table 2). Compared to the non-state enterprises, B and C adopted even more aggressive overtime policies. Moreover, various types of temporary workers were used in all of the enterprises; and an illegal practice i.e. not signing labor contracts with temporary workers was found in three enterprises with different ownerships (i.e. C, F, and G). As the HR manager of F said: “Our employment policies were more flexible than SOEs’ in the 1990s. But now there are almost no differences between SOEs and us.” (interview)²⁶

Compared to numerical flexibility, functional flexibility was much less popular in the case-study enterprises. First, as indicated in Table 4, teamwork was only adopted to some extent (such as on the line of new products) in the assembly sub-plant of A. In general the manufacturing managers and sub-plant/workshop managers in these enterprises believed that, given the nature of production (i.e. small batch, varieties of products) of this industry and workers’ skills, the most effective way to organize work was “fixed person, fixed post” (*dingyuan dinggang*), i.e. breaking assembly processes into separate tasks and attaching each worker to a specific task. Although work groups still existed in these enterprises, group members had distinct job classifications and seldom communicated and cooperated. Thus these work groups were different from the traditional ones that organized work on a collaborative basis. Such Taylorist work organization, argued by those managers, could minimize skill requirement, maximize the output of individual workers, and facilitate performance (i.e. production volumes and quality) appraisals.

Insert Table 4 about here

²⁶ In China when people especially HR managers talk about employment flexibility, they usually only refer to numerical flexibility.

Second, it is worth noting that quality circles (QC) or other off-line teams with the goal of improving product quality were adopted in all of the enterprises except for G. However, in the four SOEs, these were not new practices deliberately implemented to enhance flexibility, but extensions of their traditional practices of “raising rational suggestions”. Formalism remained for most participation practices except for the QC system, which copied the Japanese model and was widely introduced in SOEs in the early 1980s. In these SOEs, QC existed in each sub-plant and department; and some QC even won awards in the national QC competition. Given the cash rewards provided by the enterprises, workers especially skilled workers often actively participated in QC, which to certain extent enhanced functional flexibility. QC did not exist in E, F, and G. However, E had off-line teams and intensive “continuous improvement” programs introduced by the US parent company. Such off-line teams, however, were not common in F and did not exist in G (see Table 4).

Third, since “fixed person, fixed post” was popular in these enterprises, job rotation with the goal of promoting multiskilling was only adopted to a limited extent in A and E. Nonetheless, all the enterprises had realized the benefits of having multi-skilled workers and thus encouraged workers to gain more skills (e.g. A, B, C, D, and E reimbursed certification expenses to workers who successfully obtained skill certificates). As a result, certain percentages of workers had two or more skill certificates (see Table 4). These workers sometimes were temporarily deployed by shopfloor managers to bottleneck processes or to substitute absent workers. In addition, workers were given increasing tasks and responsibilities in recent years, such as monitoring quality, cleaning, and maintenance. Through these practices, functional flexibility in these enterprises was improved to certain

extent.

Finally, compared to the traditional unified “iron wage” system, wage systems in these enterprises had become much more flexible. For production workers, A, B, C, D, and G adopted piece rates, E used post wages with simultaneous consideration of skills, and F paid workers based on their posts and performance (see Table 4). In addition, penalties for various misoperation and misbehavior were widely used in these enterprises to control quality and strengthen labor discipline. For managerial staff of these enterprises, wages were based on posts and performance. However, performance pay tended to be egalitarian due to the less developed appraisal systems.

In sum, functional flexibility practices were adopted by these enterprises in a piecemeal manner, and some were in fact extensions of traditional practices. While certain flexibility was achieved through multiskilling, multitasking, and wage systems, some key practices of functional flexibility such as teamwork and job rotation were largely missing. Moreover, as shown in table 4, the development of functional flexibility (in terms of the number of practices adopted and the percentages of workers involved) in these enterprises varied, with A and E ranking the highest and the lowest respectively.

Institutional Antecedents of Extreme Numerical Flexibility

Several institutional changes have provided important pre-conditions for the case-study enterprises to break away from the traditional rigid employment system and march to extreme numerical flexibility, which will be examined below.

The Changing Household Registration System and Social Protection System

An important precondition for the adoption of numerical flexibility practices is the

existence of a labor market, which was missing in the pre-reform era. The changing household registration system and social protection system have played key roles in promoting labor mobility and creating urban labor markets.

The household registration system is an institution controlling population movement. Under this system, each individual is required to register in one and only one place of residence; and any change of registration requires official approval. This system was initially implemented in Chinese cities in 1951 and expanded to rural areas in 1955.²⁷ While the original purpose of the household registration system was not to control the mobility of the people, the government started to strictly restrict cross region especially rural-to-urban migration in the 1960s, for reasons such as food shortage (Wu 1994; Zhao 2000) and the needs of heavy industry oriented development strategy (Chan 1994; Lin, Cai, and Li 1996). The effectiveness of the household registration system in suppressing rural-to-urban migration was further increased by the other two systems. One was the People's Commune system in rural areas, which made farmers bound not only to their families but also to the entire rural settlements. The other was the ration system in cities, under which basic staples such as grain, meat, cooking oil and sugar could be bought only in state-run stores using ration certificates or coupons, which were distributed to local residents with an urban household registration. In addition, urban residents were entitled to administrative job allocations, the subsidized education system, welfare programs, and community cultural activities. All of these made internal labor mobility especially rural-to-urban migration extremely difficult.

²⁷ See the State Council, "*Guanyu jianli jingchang hukou dengji zhidu de zhishi*" (Directive Concerning the Establishment of the Regular Household Registration System), issued on 22 June 1955.

After the economic reform, the Household Responsibility System replaced the collective production team system in rural areas leading to improved productivity, personal freedom of farmers, surplus labor in rural areas, and the availability of food in the urban free market. In addition, the ration system was abolished in all the cities by 1993. These made rural-to-urban migration possible. Since the 1980s, the government started to reform the household registration system loosening the restrictions on labor mobility. In particular, two special types of residential registration administered by local governments were introduced in Chinese cities. One was the temporary resident permit that could be issued to anyone who had a legitimate job or business in the city; the other was blue card issued to investors, buyers of property, and professionals (Liu 2005). Since the late 1990s, the government has allowed even greater labor mobility (Chan and Zhang 1999; Liu 2005). Specifically, the internal migration restrictions have been further relaxed especially for highly educated “talents” and skilled workers; the decade-old rural-to-urban migration quota system in all small cities and towns has been abolished since 2001; household registration for investments and housing purchases has been widely adopted nationally; and elimination of the rural/urban distinction in the household registration system has taken place in more and more provinces (Wang 2004). In Xuzhou, where the case-study enterprises locate, the restrictions imposed by the household registration system on labor mobility have been greatly relaxed. In particular, the rural and urban household registration has been consolidated erasing the rural/urban distinction; both college graduates and graduates of technical schools can get the local household registration if they find local jobs; and a local household registration can be granted to a person as long as the following criteria are met: having a fixed place or residence;

having legal and stable income; and having contributed to the pension scheme for more than two years. Without these policies, the case-study enterprises would have been not able to use the various types of temporary workers the majority of which came from rural areas. My informal talks with some temporary workers also suggested that urban household registration was no longer a barrier for these workers to work in the enterprises.

Another important institution that contributes to the formation of urban labor markets is the changing social protection system. China's social protection system was established between 1948 and 1950, including old age pensions, health insurance, workers' compensation, paid sickness leave, maternity benefits for women and many other welfare services (White and Shang 1996). However, due to its limited capacity, the government restricted the social insurance coverage to the privileged state sector leading to a fragmented social insurance system (Shang 1999). The key providers of social welfare were work units (or *danwei*), many of which established what became known as a mini-society with a "cradle to grave" social protection system (Child, 1994; Walder, 1986; Warner, 1995; West, 1999). This system on the one hand gave urban workers a high level of security, but on the other contributed to an extreme lack of labor mobility since social benefits were tied to individual enterprises (Howard 1991). As some researchers observed, many jobs outside the state sector, despite higher wages, failed to attract employees from the over-staffed SOEs since they did not want to give up many social protection benefits (Maurer-Fazio 1995; Smyth 1999).

China has been reforming the enterprise-based social protection system since the 1980s, with the goal of establishing a unified social insurance regime which is state managed but places a high degree of responsibility on the individual (Whiteford 2003; Zhu and Nyland

2005). However, because China does not have a national social insurance law, provincial and municipal governments formulate local rules and individual and enterprises' contribution rates based on national guidelines and local conditions (Nielsen et al. 2005). Presently, major elements of the new social protection system include retirement, unemployment, medical, industrial injury, maternity, and housing (Zheng, 2000). The system is financed jointly by individuals, enterprises, and government with individuals and enterprises being compelled to make their due contributions. All employees receive the same level of social protection irrespective of where they are employed, unless the base cover has been supplemented by their employers (Guan 2000; Wang 2001: 63). This social protection system therefore significantly facilitates labor mobility across enterprises especially between SOEs and non-state enterprises. In Xuzhou the social insurance contribution rates of individuals and enterprises in 2007 were as follows: pension (enterprise: 22%; individual: 8%); medical insurance (enterprise: 7%; individual: 2%); unemployment insurance (enterprise: 2%; individual: 1%); industrial injury insurance (enterprise: 1%); maternity insurance (enterprise: 0.6%); and housing fund (enterprise: 10%; individual: 10%). Given the unified social insurance contribution rates and the same level of benefits, both workers and managers in my case-study enterprises agreed that social benefits were not a factor influencing their job choices.

It is worth noting that the changing household registration system and social protection system has not only promoted labor mobility and the development of labor markets, but also increased informal employment. On the one hand, the weakening migration control has generated a large "floating population" in Chinese cities which is the major source of

informal workers. On the other hand, the household registration system retains its discriminatory features against the rural population and places temporary rural migrants in a disadvantaged position in urban labor markets (Chan 1996). For instance, although migrant workers with temporary resident permits can send their children to local schools, they must pay fees and tuitions that are substantially higher than those paid by local urban residents. In addition, many local governments continue to require enterprises not to hire workers without local household registration especially in some sectors (Liu 2005). The present social protection system also excludes a large number of migrant workers. Although many local governments have started to provide social insurance schemes for migrant workers, numerous problems make these efforts largely ineffective. In particular, the household registration system fundamentally determines that migrant workers cannot really benefit from China's social protection system which follows the geographic principle (i.e. migrant workers cannot receive social insurance benefits once they return from the workplaces to their hometown). As a result, the social insurance coverage of migrant workers is very low; and many migrant workers withdraw their participation when they change jobs (Liu, Yu, and Liu 2006). The social and employment discriminations against rural population provide enterprises opportunities and incentives to informally employ migrant workers. Since the workers with temporary resident permits would not stay in one enterprise or one place for a long time and did not care about social insurances, some of my case-study enterprises therefore did not give labor contracts to these workers and some paid lower social insurances to them through labor dispatching. Moreover, because these workers did not enjoy equal employment rights in cities, they were often required to work extremely long hours and paid lower than formal urban

workers in all of my case-study enterprises.

In sum, the changing household registration system and social protection system have contributed to the formation of labor markets in China as well as their informalization, which enables enterprises to pursue numerical flexibility.

The Establishment of the Labor Contract System

Although the use of contract labor was not new in China (Blecher 1983; Howard 1991), the gradual establishment of the labor contract system marked a significant departure from the “iron rice bowl” system. The labor contract system was firstly experimented in Shanghai and the special economic zones (Shenzhen and Zhuhai) in 1980 (Howard 1991; You 1998:52). In 1983 the Ministry of Labor called for the universal introduction of the labor contract system; and this system officially applied to all new recruits in SOEs (except for university and technical school graduates and demobilized army personnel) in 1986.²⁸ After a period of slow and gradual expansion, the labor contract system was finally enshrined in the 1995 labor law and expanded to all employees in all types of enterprises. The 2008 labor contract law adds more details to the system, but its principles remain unchanged.

The three major principles of the labor contract system are: (1) a written labor contract with detailed terms of employment (such as employment length, working time, wages, benefits, and the terms for changes, renewal, and cancellation of the contract) should be signed between the employee and the employer; (2) the contract is voluntary and renewable (if both parties agree); (3) the contract can be terminated by either parties (Gallagher 2005:

²⁸ For details see the Ministry of Labor’s circular and “Temporary Regulations Regarding the Recruitment, Testing, and Selection of Workers” (February 22 1983); and the State Council’s “Temporary Regulations on the Use of Labor Contracts in SOEs” (1986).

105). While the original intention of these principles was to abolish the administrative assignment of lifetime employment as well as provide protections for workers, in reality the contractual employment enabled enterprises to pursue extreme numerical flexibility.²⁹

First, the labor law stipulates three types of labor contracts: fixed-term, open-ended (or non-fixed-term), and contracts taking the completion of a specific amount of work as a term. The most popular type is fixed-term contracts, which allow enterprises to make use of short-term employment to enhance numerical flexibility (Qiao 2008). Table 3 indicates the prevalence of short-term labor contracts in the case-study enterprises. In A and E, there were some temporary workers whose contract term was only three months or six months; and in A, C, and E, the majority of workers only had one year labor contracts. Although the labor contract system also encouraged open-ended contracts to stabilize the workforce, its regulations made it very difficult for workers to receive this type of contracts. According to the labor law (Article 20), three conditions must be met to obtain an open-ended contract: (1) an employee has worked for the same employer for a consecutive period of ten (or more) years; (2) both the employee and the employer agree to extend the term of the labor contract; (3) the employee must request for an open-ended contract. Since employers can either block the first condition by terminating the labor contracts before they reach ten years or simply refuse to renew the labor contracts, the conclusion rates of open-ended contracts in the assembly sub-plants/workshops of the case-study enterprises were very low ranging from 0 in B, C, and F to 16.7% in E. When asked the tactic of dealing with workers' requests of open-ended contracts, the HR manager of C said: "Our method is putting off (*tuo*). We

²⁹ This part is based on the 1995 labor law since the 2008 labor contract law had not come out when this study was conducted. However, the impact of the 2008 contract law on numerical flexibility will be discussed later.

usually let these workers wait. After some time, the workers will change their requests to fixed-term contracts because they are afraid that we will not renew their contracts. If some workers continue to request for open-ended contracts, we will let them wait until they change their minds.” The third type of labor contracts i.e. those taking the completion of a specific amount of work as a term, allows enterprises to use temporary workers. However, this type of temporary labor was not common in the case-study enterprises. Only a few peasant workers who engaged in some temporary heavy labor or dirty jobs were given such contracts.

Second, the labor contract system allows probation periods, which provides opportunities for enterprises to reduce labor costs and increase numerical flexibility by hiring temporary workers in the name of apprentices. The labor law states that the longest probation period is six months (see Article 21), but in reality enterprises often extend probation periods at will. Moreover, probation periods are often not included in the terms of labor contracts. In the seven case-study enterprises, probation workers either signed special probation contracts rather than labor contracts or did not have any contracts at all. In addition, the labor law allows enterprises to dismiss probation workers without limitations, which resulted in the cyclic use of technical school graduates as apprenticeship labor in the case-study enterprises.

Third, the labor law stipulates nine circumstances under which enterprises can terminate labor contracts, granting employers significant power and flexibility in adjusting their workforces. These circumstances include: agreement of termination between the parties involved through consultation; proved incapability of probationary workers to meet recruitment requirements; employees’ serious violations of enterprise rules, regulations, and disciplines; employees’ serious dereliction of duty or engagement in malpractice for selfish

ends that cause great losses to enterprises; criminal behavior; employees' loss of capability of working after medical treatment for illness or injury not suffered at work; employees unqualified for their jobs; significant changes of the objective conditions taken as the basis for the conclusion of the contract; and enterprises facing serious economic difficulties or bankruptcy (see Article 24, 25, 26, and 27 of the 1995 labor law). Through these regulations, enterprise, especially POEs, IJVs, and WFIEs have gained great freedom of dismissals. A good example is G which terminated labor relationships with near half of its workforce in 2004 when it faced economic difficulties. Although SOEs still face various constraints in terminating labor contracts, their legal power of dismissing workers provides them a significant leverage to gain workers' conformity to various numerical flexibility practices such as internal retrenchment and extreme overtime work. The "forced" employee-proposed termination of labor contracts in the case-study SOEs exactly resulted from the terrifying effect of the enterprises' power of firing workers. And this power also forced the workers to accept extreme overtime without sufficient compensation. Moreover, the labor law allows termination of labor contracts when they expire or the conditions for the termination as agreed upon by the parties involved emerge; and employers do not need to pay any compensation for such termination. This further increases employers' capability of downsizing their workforces and encourages the use of short-term contracts.

In sum, the labor contract system designed to provide freedom of employment choice for both workers and enterprises has only benefited employers and high skilled employees. The individual nature of labor contracts fragmentizes Chinese workers and weakens their bargaining power in employment relationships. Moreover, the hiring and firing autonomy of

enterprises granted by the labor contract system has greatly increased numerical flexibility and hegemonic management control in the Chinese workplace.

The Weakening Workers' Representation in the Workplace

Numerical flexibility practices may be tremendously constrained by strong trade unions. Yet, this does not happen in contemporary China. As a socialist state, China has a highly developed trade union organization and the largest number of union members in the world. However, ideologically conceived as a mass organization of the working class led by the Communist Party, Chinese trade unions have failed to act independently and effectively protect workers' interests. Before the economic reform, Chinese enterprise unions performed a variety of political and economic roles in the workplace, such as promoting production through labor emulation, assisting enterprise management in providing welfare services, and organizing workers in spare-time cultural, political, and technical studies, vocational training, and recreational activities (Ding, Goodall, and Warner 2002; Ng and Warner 1998). While unions were often criticized of their "economism" and "welfare trade unionism", they were able to promote certain workers' interests in the workplace especially under the support of the Party.

China's economic reform since the 1980s has ushered enterprise unions to a new round of descent (Chan 1998, 2000; Lee 1999; Zhao and Nichols 1996). In SOEs management has gained increasing autonomy and discretionary power over issues such as hiring, firing, wages, investment, and production plans. The intertwining of the goals of the Party and management has further reduced unions' influences (Gallagher 2005). In the non-state sector, despite the trade union law states that enterprises with over 25 employees should have unions,

the unionization rate is low especially in Asian invested enterprises and domestic POEs. The ACFTU's (All China Federation of Trade Unions) organizing campaign since 2000 has significantly increased the number of enterprise unions in the non-state sector, but these unions are usually dominated by employers and many of them only exist on paper (Liu 2008). In addition, enterprise unions have gained two new functions since the 1990s, i.e. collective consultation and labor dispute mediation. However, the collective contracts are usually characterized by strong formalism (Clarke, Lee, and Li 2004; Warner and Ng 1999); and union mediators often stand for management with the goal of maintaining stability. In general, the Chinese workplace has changed from "organized dependence" to "disorganized despotism" (Lee 1999).

All of the case-study enterprises had trade unions, which rather automatically signed up new employees when they concluded labor contracts with the enterprises. As a result, almost all the formal employees in these enterprises were union members. However, as Table 5 indicates, there were only three enterprise unions (i.e. A, C, and E) that had full time union staff. Moreover, most union chairmen were part time; and two of them (i.e. F and G) were middle level managers. The significant lack of staff reflected the marginalized status of these enterprise unions.

Insert Table 5 about here

All of the seven enterprise unions were a tool of management, but they had slightly different functions and influences in the workplace (see table 5). First, unions in F and G were losing functioning and influences. Neither of them had full time staff and union offices. However, because Xuzhou Trade Union Federation commissioned membership fee collection

to Xuzhou Tax Bureau, both of the two enterprises paid their union fees in full. They also had special union accounts to receive the returned membership fees (60%), but the unions could not use the money without the general managers' authorization. As a result, their welfare activities were very limited. Table 5 shows that only 15.2% of surveyed workers in F were satisfied with the union. As a salesman in the marketing department of F said, "Our union does not have any use at all." However, although the union in G was also becoming marginalized, two reasons made much more surveyed workers (47.4%) satisfied with it. First, the majority of G's workers did not have labor contracts (65.3%, see table 3) and thus were excluded from union membership and benefits. Compared to those workers, the surveyed workers who were formal employees might attribute their better employment conditions and benefits to the union. Second, the surveyed workers were very young (the average age was 24) and most of them came from rural areas without sufficient knowledge of unions (two of them did not even know what was a trade union). Since most of them could not differentiate the union from the management, they might be confused about their satisfaction with the union and the organization.

Unions in B, C, and D seemed to be a more functional managerial tool. Although having few full time staff, these unions had special offices and sufficient funds within their discretion. The traditional enterprise union functions such as welfare, labor emulation, and democratic management that included organizing workers' congresses and information sharing were still important parts of these unions' daily work. In addition, these unions joined management in various shopfloor disciplinary inspections on issues such as attendance, work behavior, and cleanness. In many workers' eyes, the major job of these unions was strengthening labor

discipline. As an assembly line worker in C said: “The union staff were really bad. They often impose fines on us. They are worse than many supervisors.” Facing with the extreme numerical flexibility practices such as internal retrenchment and overtime in these enterprises, the unions were not able to confront the management at all. Although the collective contracts stated that employment practices should follow the requirement of the labor, in practice neither the management nor the unions paid attention to these formalistic rules. The workers’ congresses that were held once a year in these enterprises were also characterized by strong formalism. As a worker in B told me: “The workers’ representatives are in fact designated by supervisors and managers. They always choose their favorite workers (*qinxin*). Those workers cannot represent us.” When asked the union’s attitude toward extreme overtime, the union chairman in D said: “We adopt a flexible approach toward overtime. The enterprise does not pay workers overtime compensation, but workers’ piece-rate based wages already increase. Managerial staff also work overtime, six or six and a half days per week, although there is no strict requirement on this. We SOEs emphasize ‘sacrifice’ (*fengxian*). The union should speak for workers, but we also need to consider the enterprise’s conditions. Protecting the enterprise’s interests is protecting workers’ fundamental interests.” Based on this logic, these unions’ new function i.e. labor dispute mediation was also largely meaningless for the workers. As admitted by the union chairmen of B, C, and D, few workers went to them for labor dispute mediation. Instead, the workers often directly went to the local labor arbitration committees. When this study was going on, there was a work stoppage in a sub-plant of D, because the workers there could not bear their low wages anymore given the rapidly raising inflation level. The union chairman went to mediate, but as the enterprise’s representative.

What she did was just trying to persuade the workers to consider the enterprise' economic conditions and accept the low wages. According to a worker in C, "The trade union is not our workers' organization at all. The union people are cadres, only speaking for the factory."

Unions in A and E were the "best" among the seven enterprise unions, in that they sometimes were able to speak for workers and that more workers were satisfied with them (see table 5). The union in A to a large extent kept its socialist tradition, performing all the standard enterprise union functions relatively well. In particular, it acted as a "transmission belt" between the management and workers, helping the management communicate with the workers and reflecting the workers' concerns and complaints to the management. The workers seemed to welcome the middleman role of the union. According to the union's own survey, when the workers had labor disputes, the highest percentage (34.67%) would firstly go to the union for mediation. When the workers' interests were not in conflict with those of the enterprise, the union was even able to represent the workers against lower level managers and supervisors. For example, due to the malfunction of an equipment in the night shift, a production line did not achieve its quota. The line manager thus did not allow the workers to get off despite they had worked 12 hours. However, the continual work of the night shift workers would interrupt the day shift production since the day shift workers had already come to work. Therefore, after receiving the workers' call, the union chairman decided to intervene. He firstly got the general manager's support, then went to the production line in person, and required the line manager to let the workers get off.³⁰ Unfortunately, for the numerical flexibility practices initiated or supported by the top management, the union had

³⁰ Interview, the union chairman of A.

never been able to challenge. As the union chairman admitted, some workers went to him complaining the extreme overtime. But what he could do was just persuading the workers to work for the interests of the enterprise.

The union in E also had certain strength. The general manager was a Singaporean appointed by the US parent company, who supported the union's activities especially labor emulation and labor dispute mediation. The union even concluded wage agreements with the management, according to which the wage increase rates in 2000 and 2007 were 7% and 10% respectively. However, these were not negotiated rates, but unilaterally determined by the general manager.³¹ Under the support of the Chinese vice general manager and Party secretary, the union had spoken for several old workers whose labor contracts would be terminated by the general manager. As a result, these workers were allowed early retirement which was much better than dismissals.³² While the union, united with the Chinese management, was able to play a certain role in preventing the foreign management from firing too many workers, it did not have a voice for most numerical flexibility practices including internal retrenchment and overtime.

In general the seven enterprise unions were not able to confront the management and challenge the managerial labor practices. Some of them had become either useless or completely alienated to workers. Even in the best cases of A and E, the unions could only play a very weak representative role while failing to change the numerical flexibility practices. Thus, the weakening workers' representation in the workplace has provided another precondition, i.e. management-dominated enterprise unions, for the widespread numerical

³¹ Interview, the union chairman of E.

³² Interview, the general manager of E.

flexibility.

The Ambiguous Labor Regulations and Weak Enforcement

Legal loopholes on some numerical flexibility practices and minimum punishment of violating labor regulations are another two preconditions for the widespread numerical flexibility in the Chinese workplace. Labor regulations in China include the labor law, labor policies and regulations issued by the State Council and the Ministry of Human Resources and Social Security (former Ministry of Labor and Social Security), local (i.e. provincial and municipal) decrees issued by local People's congresses, and local administrative rules issued by local governments. The labor law establishes a wide range of labor standards (with the major exception of freedom of association) which are comparable to many developed countries, but many articles are too vague or too general (Ngok 2008). The labor policies and regulations issued by various agencies, which are not always consistent with the labor law, further increase regulatory complexity and ambiguity (Cooney 2007).³³ As to labor regulations related to numerical flexibility practices, the following legal loopholes are striking.

First, the labor law and various labor regulations do not clarify the time limit for employers to conclude labor contracts with new employees, which allows enterprises to employ workers without giving them labor contracts. Although the labor law does set up six months as the maximal probation period, it fails to specify detailed regulations on employers' use of probation. Moreover, the labor regulations only apply to written labor contracts while lacking corresponding rules for *de facto* employment relationships, which leave workers

³³ Legal ambiguity and loopholes are not only limited to labor regulations. In general China's law is confusing in many areas and contains many gaps (Peerenboom 2002).

without labor contracts unprotected. The use of temporary workers without labor contracts and the large number of apprenticeship labor in the case study enterprises was to a large extent encouraged by these legal loopholes. Second, the Labor Law does not specify the terms and conditions of fixed-term contracts such as the scope of application, the maximum and minimum duration, and the maximum allowable times of renewal, thus granting employers great freedom in contract conclusion. In addition, there are no constraints and costs for the ending of short-term contracts. These legal loopholes thus contribute to the wide use of short-term labor contracts in the workplace, even for many permanent positions. Third, there are no clear and unified regulations on internal retirement especially the status and treatment of internal retirees. As a result, different regions, sectors, and enterprises have different policies which are often in favor of enterprises' interests. An example is the loose and flexible internal retirement policies in the case-study enterprises that led to the large scale internal retirement. Fourth, the labor law and other regulations are silent on the use of dispatched labor. Enterprises thus view labor dispatching as an effective way to gain numerical flexibility and reduce labor costs while without violating the labor law. Finally, there is no stringent punishment for violations of the labor regulations. Although the labor law stipulates that labor contracts shall be concluded, it does not specify the legal consequences in case of violations. If employers illegally revoke labor contracts or deliberately delay the conclusion of labor contracts, the penalty will only be making corrections and compensating for any losses that may have been sustained by laborers (see article 98 of the labor law). In the case of extremely long working hours, employers will be required to cease work in excess of permitted hours. If employers refuse to comply, a fine of

up to RMB¥ 20,000 (about US\$ 2,500) will be imposed, but no more pressure if employers still refuse to pay (see the 2004 Labor Inspection Regulations). The lack of or lenient punishment makes the costs of violating the labor law very low, thus encouraging enterprises to ignore any labor regulations.

Weak enforcement further makes the labor regulations on numerical flexibility practices and corresponding punishment useless. The major state agencies in charge of the implementation of China's labor regulations are labor bureaus at various administrative levels. However, both the quantity and the quality of labor inspectors in these agencies are far from enough to ensure labor law implementation. In Xuzhou, there were merely sixty full time labor inspectors in 2006 who were in charge of over 20,000 employing units and over a million employees. Moreover, the turnover of these labor inspectors was high; many of them did not have sufficient knowledge of labor regulations; and in some counties/districts of Xuzhou the labor inspectors only had the capacity to deal with workers' complaints while not able to do any workplace inspections.³⁴ In addition, although clear processes and rules for dealing with labor complaints, conducting inspections, and imposing penalties on recalcitrant enterprises exist at the national level (for details see the 2004 Labor Inspection Regulations), in practice labor inspections are heavily influenced by local governments which, often obsessed with economic development or having corrupt relationships with employers, tend to stand up for capital and suppress labor (Cooney 2007). As a result, labor inspectors often refrain from properly implementing the law if it may affect favored enterprises (Taylor, Chang, and Li 2003: 43–45). A worker in C who could not bear extreme overtime any more

³⁴ An internal report of Xuzhou Labor and Social Security Bureau on labor inspections.

went to the Xuzhou labor bureau to complain. However, the general manager of C who was also a government official (because this was a large listed SOE) immediately settled it down by inviting the labor bureau officials for a dinner. Later, C fired this worker to warn his fellows.³⁵ Even if labor inspectors do try to enforce the labor regulations, they can only impose penalties such as warnings, correction notices, and a small amount of fines, while lacking the power to seriously challenge employers (Cooney 2007).

Another way to enforce labor regulations is making use of the labor dispute resolution system. However, various shortcomings and flaws exist in China's labor dispute resolution system leading to its failure of ensuring effective enforcement of the labor law (Cooney 2007).³⁶ The most salient ones are as follows. First, the labor dispute resolution procedures include mediation, arbitration, and two trials. While mediation is often bypassed, labor dispute cases cannot be brought to courts without going through arbitration. As a result, most cases need two hearings, by the labor dispute resolution committees and the courts respectively. And some cases may need the third hearings of higher level courts. Therefore, it often takes a long period to reach a verdict for a labor dispute case, which cannot be afforded by many workers especially migrant workers. Second, complainants must initiate arbitration within sixty days after they know or should have known of the harm. Since it is often very difficult for workers to immediately realize employers' illegal labor practices, many of them are in fact excluded from the legal channel of resolving labor disputes. Third, similar to the labor bureaus, the labor dispute arbitration committees do not have sufficient autonomy. In

³⁵ Informal talks with some workers in C.

³⁶ This part is based on the labor dispute resolution system at the time when this study was conducted. The Labor Dispute Mediation and Arbitration Law which came into effect on May 1st, 2008 brings some changes to this system, but remains its basic principles, structure, and procedures, which will be discussed later.

principle these committees are tripartite autonomous bodies, but in reality they are dominated by representatives from the labor bureaus who are very likely to favor government and enterprise interests over workers (Gallagher 2005: 74). Finally, both arbitral awards and final verdicts of the courts may be meaningless for workers since they are often difficult to enforce in China (Chen 2002; Clarke 1996; Cooney 2007). Moreover, partly due to the lack of confidence in the legal system and partly due to the Chinese cultural tradition that discourages dispute resolution using a judicial approach (Fox, Donohue, and Wu 2005), workers only view the legal channel as their last resort to protect their interests and often do so after they lose their jobs or have decided to leave their enterprises. Therefore, it is not surprising that only a very few of workers in the case-study enterprises, less than 10 in each enterprise in recent two years, had brought their labor disputes to the local arbitration committees. According to some workers I talked to, they doubted the fairness of the courts and did not want to become “an open enemy of the enterprise” which would make them feel very uncomfortable to continue working there.³⁷

In principle trade unions are another force in strengthening labor law enforcement. However, as already shown in this paper, enterprise trade unions are too weak to monitor managerial labor practices. In short, all the three ways that may ensure the implementation and enforcement of labor regulations fail in contemporary China.

To conclude, the changing household registration system and social protection system, the establishment of the labor contract system, the weakening workers’ representation in the workplace, and the ambiguous labor regulations and weak enforcement have provided a

³⁷ Interviews with some workers in the case-study enterprises.

series of preconditions i.e. a labor market and its informalization, contractual employment, management-dominated enterprise unions, and loose legal environment, for Chinese enterprises to fare to extreme numerical flexibility.

Institutions, Markets, and Imperatives for Extreme Numerical Flexibility

While increasing product market competition and greater diversity of labor markets are universal driving forces of numerical flexibility all over the world, several institutions in China, the legacies of the planned economy or culture, further increase uncertainties and fluctuations of product markets and worsen the labor market condition of surplus low skilled labor and scarce high skilled labor, pushing enterprises to adopt numerical flexibility practices for their survivals. The following section will examine these institutions as well as the imperatives they create through product and labor markets in detail.

The Macroeconomic Control (*hongguan tiaokong*) of the State

One of the key institutional characteristics of China's statist market is heavy and frequent state intervention of the economy. In fact China's economic reform is characterized by progressive development of market mechanism with continual functioning of the socialist plan-based system. While it is true that in even the most market-oriented systems governments use regulatory systems to foster conditions for successful markets (Fligstein 1996; Lindblom 1977), the state intervention of market i.e. the so-called macroeconomic control (or macro control) in China, is far more extensive and intensive, resulting in highly unstable and unpredictable product markets.³⁸ Macroeconomic control measures in China include monetary and fiscal policies, legal regulations, centralized economic planning,

³⁸ However, the goals of macroeconomic control in China are promoting employment and economic growth, stabilizing price, and maintaining equilibrium of balance of payments.

industrial policies, and direct administrative intervention. In particular, while the Chinese state has started to use more and more instruments of macroeconomic policies such as interest rates and tax policies to indirectly intervene in the economy, direct administrative interventions such as direct government investments, administrative approval of projects and the use of land, direct credit control through the state-owned banks, and administrative control of market prices still play a very important role (Liu 2005a; Pang 2006). Since the economic reform, the Chinese state has implemented six rounds of macroeconomic control: 1979-1981, 1985-1986, 1989-1990, the second half of 1993-1996, 1998-2002, and the second half of 2003-2004, each of which has significantly impacted domestic product markets although the degrees vary for different industries (Liu 2005b; Pang 2006; Wang 2008). Moreover, the six rounds of macroeconomic control have different background, nature, and focuses. The first four focused on inflation and aimed to tighten the economy; the fifth tried to control deflation by expanding domestic investment and demand; and the sixth focused on bank credits and land use with the goal of suppressing the rapid development of some industries such as steel, cement, electrolytic aluminium, and real estate while maintaining the development of others (Dong 2005; Liu 2005b; Pang 2006). In addition, while the first five rounds of macroeconomic control were reactive interventions of the state after inflation or deflation had emerged, the latest one was proactive response of the state before the economy became overheated (Wang 2008). These further make it difficult for enterprises to predict when and how the state will intervene in the market.

The construction machinery industry in China is a very cyclical one. Because the products of Chinese construction machinery enterprises, due to their low-end nature, are

mainly sold in the domestic market, this industry has to heavily depend on domestic fixed assets investments, which makes it vulnerable to the state's macroeconomic control (Kong 2004). As figure 1 shows, all the six rounds of macroeconomic control have significantly impacted the total sales of the four major products of this industry, i.e. loaders, road rollers, tyre cranes, and excavators, which are also major products of the case-study enterprises C, D, A and B, and G respectively. While during the first four rounds of macroeconomic control (which aimed to tighten the economy) the sales (in terms of the number of machines) increase rates of these products sharply declined and often became negative, during the fifth round (which aimed to expand domestic investments and demands) sales of these products rapidly increased. In particular, the effect of the expansionary macroeconomic control during 1998-2002 reached its peak in 2002 and 2003, leading to the "blowout" (*jingpen*) of the construction machinery product markets. The sales increase rates of the four major products in 2002 and 2003 were: 64.50% and 89.17% for loaders; 47.69% and 36.57% for road rollers; 58.78% and 49.04% for tyre cranes; and 58.99% and 76.56% for excavators. And the sales revenue and profits of the whole industry increased 38% and 37% in 2002 and 34% and 65% in 2003 (Zou 2004). However, the booming markets suddenly cooled off after the state intensified the new round of macroeconomic control in April 2004 through measures such as increasing the interest rate, raising capital requirement for fixed asset investments in some industries, tightening approval of new projects and land use, and reducing economic development districts from 6866 to 2053 (Dong 2005; Tang 2006; Zou 2005). Although the construction machinery industry was not the target of the macroeconomic control, the rapid decrease or slowdown of fixed-asset investments (for example, the increase rates of fixed

asset investment reduced from 53% in the first two months of 2004 to 4.7% in April of 2004) made its product markets significantly shrunk (Wang and Li 2004). As figure 1 shows, the sales increase rates of the four products greatly declined in 2004 and 2005 and some even became negative. And such shock was particularly striking for some products in the short term. As indicated in figure 2, the sales of excavators and loaders immediately and sharply decreased after April 2004.³⁹

Insert Figure 1 and Figure 2 about here

The extreme uncertainty and unpredictability of construction machinery product markets caused by the state's macroeconomic control makes extreme numerical flexibility practices an imperative for this industry. As reported by some observers, while in the early 2000s workers in the construction machinery enterprises usually had to work overtime, in 2004 many of them were dismissed or laid-off, took long leaves, shared jobs, or worked in reduced time (Dong 2005; Han 2004; Zhao and Li 2005). The case-study enterprises had adopted the same numerical flexibility practices. In 2003, the monthly overtime hours of some workers reached 200, over 5 times of the legal limit (which is 36 overtime hours per month); all of the enterprises used a large number of temporary workers; and A, B, C, and D outsourced many parts and components. In 2004, however, all of the enterprises tremendously reduced their temporary workers; both E and G dismissed over 200 formal workers accounting for 30% and 50% of their total workforces respectively; B, C, and D reduced their formal workforces by forcing many employees to retire early; A, B, C, and D got some outsourced parts and components back to in-house production; and the workers in all of the enterprises took long

³⁹ The slack season of China construction machinery industry is January and February and the peak season is March-June. The sales declines in the peak season further indicate the influence of macroeconomic control.

leaves or worked in reduced time (three or four days per week).⁴⁰ Thus, not surprisingly, all the HR, manufacturing, and sub-plant managers of these enterprises I interviewed clearly identified the state's macroeconomic control as one of the most important factors influencing their production and employment.

The Underdeveloped Business Credit System

Another key character of China's transitional economy is the significantly underdeveloped business credit system. Business credit largely did not exist in China in the planned economy since the state directly allocated resources and intervened in enterprise production. Since the economic reform, product markets have gradually developed and market mechanism has become increasingly important in economic transactions. However, the business credit system is still far from established in China (Li and Wu 2003; Zhang 2004). As a result, lack of business credit has become one of the biggest challenges for the long-term economic development of China (Yang 2005). According to Yuan (2003), economic losses caused by lack of business credit were equal to 37% of the state's fiscal income. The major problems caused by lack of business credit include payment arrears, breach of contracts, fraud financial information, fake products, violation of intellectual property rights, and so on. In particular, according to a national employer survey in 2002, payment arrears was the most common problem of business credit (Dong 2003). It is estimated that the average term of Chinese enterprises' receivables is over 120 days; enterprise overdue receivables account for 5% of total sales, 10 to 20 times than that of the developed countries; about 80% of Chinese enterprises are in "triangular debts" i.e.

⁴⁰ Interviews with the workers, HR managers, and manufacturing managers of the seven enterprises.

inter-enterprise debts; and the total inter-enterprise arrears is between RMB¥ 300-400 billion (about US\$37.5-50 billion) (Bai 2004; Dong 2003; Monaghan 2004; Yang 2005; and Yuan 2003).

The causes of lack of business credit in contemporary China are identified by many Chinese researchers (e.g. Li 2007; Li and Wu 2003; Yang 2004; Yang 2005; Yuan 2005; Zhang 2004), which are briefly summarized here. First, contractual relationships and legal traditions are missing in the traditional Chinese culture. As a result, honesty and credit are merely supported by moral and religion, the constraints of which have been destroyed by the Cultural Revolution and market-oriented economic reform. Second, China does not have any legislation directly related to business credit although the principle of honesty and credibility appears in several laws such as the civil code, the contract law, and the negotiable instruments law. In addition, the enforcement of the law is so weak that the cost of discredit behavior especially defaulting can be largely ignored. Third, there is no centralized system for corporate credit information in China. While several hundred credit information companies have been set up in recent years, they are so small and separated that it is impossible to form a complete and unified enterprise credit information system. Finally, local governments' discredit behavior, corruption, and local protectionism further discourage or prevent the development of business credit.

Despite lack of business credit in China, due to fierce product market competition, enterprises have increasingly used open accounts as their unique condition of payment which leads to serious defaults and non-payments.⁴¹ Open accounts were used by all the marketing

⁴¹ According to the Coface report on corporate credit risk management in China, 88% of companies interviewed in 2006 had over 30% of their turnover on open accounts, compared to 60% in 2005 (Lafage 2007).

departments of the case-study enterprises. In some enterprises which dominated the national markets such as A and B, high percentages of advance payments (between 70% and 100% of full payments) were often required. In the other enterprises, however, the percentages of advance payments were much lower; and there were no advance payments for many sales. As a result, A and B had encountered much less defaults and payment fraud than the other enterprises.⁴² Table 6 shows the ratios of accounts receivable to sales revenue of the case-study enterprises in 2004 and 2005. Except for A and B, the ratios of the other enterprises exceeded 10% indicating high financial risk.⁴³ In addition, significant percentages of receivables may not be drawn back. For instance, in 2004 47.03% of accounts receivable of (C+D) were overdue over 3 years thus becoming “bad accounts”. Sales defaults and non-payments of the whole machinery industry in China were even worse. For instance, in 2001-2006 the average ratios of accounts receivable to sales revenue of all the 130 listed machinery enterprises ranged from 36.14% to 45.35% (Xie, Yang, and Huang 2007).

Insert Table 6 about here

The existing or potential cash flow problem resulted from sales defaults and non-payments often make enterprises unable to obtain raw materials on time thus interrupting normal production. In the case-study enterprises, defaulting was the common purchasing practice. For some enterprises, this was due to their financial problems caused by sales defaults and non-payments; for others which did not have financial problems (i.e. A and B), this practice was preventive since lack of business credit made the potential financial risk high. According to the marketing manager of A, “Contracts in China are useless papers.

⁴² Interviews with the marketing managers of the case-study enterprises.

⁴³ Generally speaking, it is risky when the ratio of accounts receivable to sales revenue exceeds 10%.

Nobody wants to be the first to obey the rules.” However, the wide use of defaulting or even non-payments often made the supply of raw materials and parts and components unstable. As the purchasing manager of C said: “Our strategy is defaulting. The sales department cannot get money back, so we have to owe a lot of money to suppliers. Suppliers thus become increasingly inactive.....We seldom pay suppliers in advance; and we often fail to pay them long time after we get their raw materials..... The responses of suppliers fall into three categories. The first category of suppliers will not sell products to us anymore even if we promise to make full payment on delivery. The second category will sell us some materials if we make some payment next time. The third category will continue to sell us products under the condition of our defaulting, but with quality discounts. Thus we have to negotiate with the quality control department to accept these poor quality supplies.”

Failing to obtain raw materials on time was common in all the case-study enterprises although some enterprises such as A and B were relatively better off. This had significant and negative effects on production and employment practices of these enterprises. All the HR, manufacturing, and sub-plant managers of the case-study enterprises I interviewed agreed that one of the major causes of overtime was delayed supply of raw materials or parts and components. Workers thus often had to slow down or stop working when they waited for input materials, but work overtime when the supplies came. As the manager of the parts and component sub-plant of C complained to me: “We do not want workers working overtime, but we really have no other ways.....Waiting for supplies is another major reason. We get the raw materials as soon as they arrive, but the supplies are still far from enough for our production. In principle the assembly sub-plant can produce 800-1000 loaders per month, but

in reality only 250-300. When workers are waiting for supplies, I ask them to do equipment maintenance or provide some training to them. In some cases, they also take short leaves. When the supplies come, however, they have to work overtime. Workers often feel frustrated about this.”

In sum, lack of business credit in China leads to serious defaulting problems which further results in uncertainties of factor markets (i.e. raw materials and parts and component markets). Failing to obtain supplies from factor markets on time has become one of the imperatives for the use of flexible working time in the case-study enterprises.

The Cultural Preference of Extremely Short Lead Time

One of the key characters of Chinese culture is high uncertainty avoidance (Hofstede 2001). When trading goods, Chinese people prefer immediate delivery to keep risks minimal. As the old saying goes: handing over money with one hand while receiving goods with the other (*yishou jiaoqian, yishou jiaohuo*). The cultural preference of extremely short lead time not only challenges enterprises’ production capacity but also increases unpredictability of product markets, which are evident in the construction machinery industry. The rapid increase of individual customers (i.e. small construction subcontractors, small business owners, and peasants) in recent years has further worsened the situation. As the marketing manager of G said: “Now the majority of our customers are peasants. We do not know when they will come. But when they come here, they usually bring cash and ask for immediate delivery. In their minds, they should get the machines as soon as they make payments, just like buying stuff in shopping malls. If we cannot make immediate delivery, they will go to other sellers. You know, the market is a buyer’s market, and there are so many big and small

competitors. They do not worry that they cannot get the machines immediately from other sellers since they have cash.” The lead time for high end products is also very short although the buyers are usually large enterprises or government institutions. For instance, F’s products mainly targeted construction projects of large SOEs or government institutions. But the marketing manager of F had similar complaints about short lead time: “Chinese enterprises do not have long term plans. When I call them to see whether they need our products in the near future, they say ‘Wait a while, we will discuss about it.’ When I call them a month later, they say ‘Wait, we are still discussing about the purchase.’ Then, after another month, I suddenly receive their call ‘We just made the decision. We need your products delivered to us within a week.’ My God.....We really cannot predict their demands and delivery time.”

Facing with extremely short lead time and unpredictability of product markets, all of the case-study enterprises had to keep sufficient manufactured inventory, as shown in table 7. However, similar to accounts receivables, such inventory also negatively influenced cash flow (especially for C, D, and G) leading to unstable supply of raw materials and flexible working time.

Insert Table 7 about here

Another way to deal with short lead time was using shift work, overtime, and temporary workers, which were widely found in the case-study enterprises. The story of F further suggests the imperatives of numerical flexibility imposed by extremely short lead time. At first, the German managers tried to transplant their just-in-time production and delivery system to F and follow the Chinese labor law in terms of employment practices. However, these did not work since F lost most orders. According to the marketing manager of F, “the

German managers could not understand the ‘time’ concept of Chinese people and the complete unpredictability of product markets.” Later, F had to change to the “Chinese way” of employment, such as two shifts work (8am-8pm and 8pm-8am), extreme overtime, and the use of temporary workers (including some illegal uses).⁴⁴

In sum, the cultural preference of extremely short lead time in China further increases unpredictability of product markets in terms of both quantity and delivery time, forcing the case-study enterprises to adopt extreme numerical flexibility practices.

The Problematic Vocational Education and Training (VET) System

The low skill levels of Chinese workers have been widely seen as one of the major problems for China’s development (e.g. Child 1994; Lu and Björkman 1997; Ng and Siu 2004; and Tsang 1994). The problematic VET system has further worsened the labor market condition of excess low skilled labor and scarce high skilled labor.

In the planned economy, VET in China was centrally controlled by the state and significantly underdeveloped. Since the economic reform, the state has tried to develop an all-round and multi-layered national system of VET with a focus on secondary technical schools. However, so far this system has not significantly changed and several deficiencies remain. Firstly, the lack of strategic planning and coordination makes training institutions (e.g. technical schools/colleges) disorganized failing to meet the market demands. In general, VET in China is managed by the Ministry of Education, the Ministry of Labor and Social Security, and their local bureaus, but many other government departments and institutions also take charges. Since various administrative agencies often fail to provide unified policies, effective

⁴⁴ Interviews with the HR and marketing managers of F.

coordination, and precise forecasting, the development of training institutions is uneven between regions, industries, and occupations leading to structural imbalance of VET. In addition, many technical schools are set up by large SOEs or sectoral administrative departments and under their direct control. These organizations do not have the expertise to give strategic directions on the development of the technical schools and tend to focus on their short-term and narrow needs of skills when making strategic planning while overlooking the long-term market demands (Cooke 2005b). As a result, the shortage of skilled workers is particularly evident in some industries such as high technology and heavy manufacturing industries.

Secondly, training institutions have limited funds and insufficient supply of training staff in terms of both quantity and quality (Cooke 2005b). For instance, in 2005 the total funds of all the 2855 technical schools was RMB ¥ 4.89 billion (about US\$ 0.61 billion), averagely only RMB ¥ 1,776 (about US\$ 222) for each student. Also in 2005, there were 161,000 full time technical school teachers, but 97,000 were classroom teachers who were not able to provide practical training (China Statistics Yearbook 2006). In addition, most teachers are not specialized in what they teach (Cooke 2005b). As a result, many technical schools lack technical facilities and qualified teachers to carry out the necessary training especially practical training. According to a national survey in 2008, 56% technical school students were unsatisfied with all the basic courses; and 100% thought that curriculum reform was necessary and that courses should be more practical (Dai 2008). The poor quality of technical school training has also been widely complained by employers. As a survey in Anhui province shows, over 80% employers thought that the practical skills of the technical school

graduates were not sufficient for their posts (cf. Cooke 2005b).

Thirdly, due to the influence of the traditional elite culture, technical schools are usually viewed as secondary education. In addition, technical workers are often poorly paid in China. According to Sun (2004), the average annual income of Chinese technical workers was merely between RMB ¥ 7,000-10,000 (about US\$ 875-1,250). Thus, the majority of students go to general senior secondary schools and universities, while only some students with the lowest academic achievement choose technical schools. This is especially true for urban students. Moreover, the 2008 national survey shows that about half of the technical school students had no interest in learning knowledge or skills at all (Dai 2008). The poor quality of technical school students used to make them difficult to find jobs after graduation (Cooke 2005b). However, given the recent shortages of labor especially skilled labor, the job market of technical school students has become much better. Nonetheless, technical schools still have recruitment problems due to the persistence of the elite culture (Li 2007).

Fourthly, although the state has enacted a number of policies and regulations (such as the vocational education law, the education law, and the enterprise employee training regulations (1996)) to institutionalize enterprise-based training, so far such effort has been unsuccessful due to the weak enforcement and lack of supervision. In particular, most enterprises did not have sufficient training funds. While the state regulates that the minimal enterprise training funds should be 1.5% of total wage bills, according to a survey of the ACFTU, the national average was 1.37%, 1.42%, and 1.38% in 2002, 2003, and 2004 respectively (ACFTU 2006). Moreover, a significant percentage of enterprises do not have any training funds at all. For instance, in 2004 390,000 medium and small sized enterprises in

Sichuan province (account for 99.2% of the total number of enterprises in Sichuan) did not have any training funds; and the 4.57 million employees of these enterprises (accounting for 85.5% of the total employment of Sichuan) had not receive any form of enterprise training at all (ACFTU 2006). Even in the enterprises that have sufficient training funds, training is often nominal with an extremely small part of funds used in workers' skill training. The ACFTU's survey shows that, in Hangzhou one of the most economically developed cities in China, while 43.3% of the enterprises did not have training funds, in those that had only 12% were used for first front workers' skill training (ACFTU 2006).

Finally, the majority of the migrant workers, the major part of the Chinese workforce, are excluded from the VET system. The state has realized this problem and started to provide vocational training to migrant workers. In 2003 the state made an ambitious plan to provide pre-employment vocational training for 10 million migrant workers and skill training for 50 million migrant workers who are already employed by 2005. However, according to the Research office of the State Council, by the end of 2005, 20% of the rural labor force had received short-term vocational training; 3.4% had received elementary vocational training; 0.13% had received intermediate vocational training, and 76.4% had not received any vocational training at all (Guo 2006).

The problematic VET system has further worsened skill shortage in China's labor market. It is estimated that only one third of Chinese workers are skilled workers; and among the skilled workers most only have elementary and intermediate level skills while advanced skilled workers and technicians merely account for 4% (Liu 2008).⁴⁵ According to the labor

⁴⁵ There are five grades of vocational certification and qualifications in China: elementary skilled workers, intermediate skilled workers, advanced skilled workers, technicians, and senior technicians.

market data of 121 cities in 2006, the ratios of job openings to job seekers for skilled workers were as follows: 1.37 for elementary skilled workers, 1.55 for intermediate skilled workers, 1.76 for advanced skilled workers, 1.96 for technicians, and 2.03 for senior technicians. In addition, there were 7.69 million job seekers who did not have any technical grades or occupational certificates, accounting for 50.4% of the total job seekers (Ministry of Labor and Social Security 2007). The supply of skilled heavy machinery workers in Xuzhou is much better than the national average since Xuzhou is a traditional heavy industry base and there are several machinery technical schools with a large one specializing in construction machinery. In addition, all the case-study enterprise had training funds ranging from 1.5% to 4% of their total wages bills, which allowed them to provide certain skill training to the workers although most funds were used in managerial training.⁴⁶ Even so, workers' skills were still very low in these enterprises. As table 8 shows, the majority of the production workers in these enterprises at most had intermediate skills; and the percentages of advanced skilled workers and technicians were very low especially in F and G.

Insert Table 8 about here

The low skill levels of the workers especially those technical school graduates who usually had intermediate skill certificates were a common complaint of the manufacturing and sub-plant managers of these enterprises. As a sub-plant manager of A complained, "those technical school graduates do not even know the tools nor are they able to read technical drawings." Another sub-plant manager of C said: "In recent years all of our new workers are technical school graduates. They have had little practical training in schools. After one year

⁴⁶ Interviews with the HR managers of the case-study enterprises.

on-the-job training, many of them are still not able to operate independently..... In general, the new workers' skills are lower than old workers." The low skill levels of the workers also contributed to the wide spread of some numerical practices such as overtime and the use of temporary labor while prevented the adoption of some functional flexibility practices such as teamwork and employee participation. The manufacturing manager of A was interested in the Western high performance work systems. However, he said: "We know that teamwork and high participation is a better way, but they require much higher skills which our workers do not have." When asked about the reasons of overtime, a sub-plant manager of D said: ".....Another reason is the workers' low skills. Many workers cannot finish their tasks on time because of their low efficiency. Moreover, the quality of their products is low. When the products fail to pass the quality inspection, the workers have to rework on them. It wastes a lot of time. But most quality problems, about 70%, are the problems of parts and components. The workers' skill levels of those suppliers are even lower." On the reasons for the use of temporary workers, the manufacturing manager of F said: ".....In addition, if our workers had the similar skills of German workers, we would not have used so many temporary workers. German enterprises depend on the quality of workers; we depend on quantity. Anyway, China has enough people."

In sum, China's VET system remains problematic, which contributes to the low skills of Chinese workers and thus makes some numerical flexibility practices necessary in the workplace.

Conclusion

The Chinese industrial workplace has been marching to numerical flexibility with Chinese characteristics. While this study only shows a picture of the construction machinery industry, studies in different industries, regions, and enterprises with different ownerships (e.g. Benson et al. 2000; Chan 2001; Cooke 2005a; Gallagher 2005; Zhang 2008; Zhao and Nichols 1996) generally support the thesis of convergence toward extreme numerical flexibility. Institutions have played an important role in pushing such convergence, by directly providing preconditions including a labor market and its informalization, contractual employment, management-dominated enterprise unions, and loose legal environment, and indirectly imposing imperatives through influencing product and labor markets. Again, while the evidences in this study mainly come from the construction machinery industry, the institutions i.e. the changing household registration system and the social protection system, the labor contract system, the weakening workers' representation in the workplace, and the ambiguous labor regulations and weak enforcement provide similar preconditions of extreme numerical flexibility for other industries. Although the impacts of the state's macroeconomic control, the underdeveloped business credit system, the cultural preference of extremely short lead time, and the problematic VET system on product and labor markets vary for different industries, the imperatives of numerical flexibility imposed by these institutions more or less exist for all of the Chinese industries. However, the institutions discussed here may not be inclusive. In particular, China's statist market economy has some industry specific institutions which need to be studied in future research.

The labor contract law that came into effect on January 1, 2008 has certain impacts on

numerical flexibility. On the one hand, the new law imposes restrictions on some numerical flexibility practices especially illegal ones. First, some illegal uses of temporary workers i.e. not giving labor contracts to temporary workers and extending probation periods of technical school graduates, are subject to penalties. This may reduce the large number of *de facto* labor relationships. Second, open-ended labor contracts are encouraged. After two renewals of fixed-term contracts, open-ended contracts should be given. In addition, employers also need to pay compensation to workers if they do not renew labor contracts, which makes the use of short-term contracts less cost-efficient. Third, the 1995 labor law states that a labor contract terminates upon emergence of the conditions for the termination as agreed upon by the parties involved (Article 23), which provides employers an opportunity to abuse the termination conditions to dismiss workers. In the new law, this practice is not allowed anymore.

On the other hand, however, the new law is still silent on some numerical flexibility practices such as the use of internship technical school students and various internal retrenchment practices. In addition, compared to the 1995 labor law, the new law does not have stricter regulations on extreme overtime. More importantly, the new law even encourages certain numerical flexibility practices. First, although the new law states that dispatched labor shall generally be used for temporary, auxiliary or substitute job positions (Article 66), the national implementation details enacted in September 2008 intentionally make this regulation ambiguous due to the concern of increasing unemployment. As a result, there are few restrictions on the use of dispatched labor except that the term of labor dispatch contracts should be at least two years. In fact, the number of dispatched labor in China sharply increased from 20 million before the enactment of the labor contract law in June 2007

to 27 million at the end of 2007 (Chen 2008). Second, while the stricter requirements for open-ended contracts benefit skilled workers and other core employees, they make low skilled workers more vulnerable to short-term contracts. My field research in Beijing, Shanghai, Hangzhou, Shenzhen, and Changchun in the summer of 2008 found that enterprises were still giving short-term (2 years or 3 years) contracts to all of the new workers and planned not to renew contracts with those who were not competent. In addition, to avoid open-ended contracts, enterprises may dismiss workers before they are eligible, which, according to many news reports in China, had happened before the new law took effect. Finally, the new law relaxes the conditions for employers to terminate labor contracts (from nine conditions in the 1995 labor law to fourteen conditions). In particular, in addition to circumstances previously specified in the 1995 labor law, i.e. employers are on the verge of bankruptcy, undergoing internal overhaul or encountering serious difficulties in production and business operation, enterprises are also able to retrench their workforces when they switch production, introduce major technological innovations or revise their business models and when other major changes occur in the objective economic circumstances on which the labor contracts are based rendering them non-performable (see Article 41). Moreover, the new law also relaxes the procedure requirement of dismissals. Only when retrenching over 20 employees or over 10% of the workforce is an employer required to explain the circumstances to its trade union or to all of its employees 30 days in advance, consider the opinions of the union or the employees, and subsequently report the workforce reduction plan to the labor administration department (see Article 41). However, according to the 1995 labor law, any reductions of employees should follow this procedure. The new article thus further

reduces the check and balance role of trade unions on dismissals.

Another important labor regulation that came into effect on May 1, 2008 is the labor dispute mediation and arbitration law. This law strengthens labor protection by: (1) increasing the role of mediation so that in some cases employees do not need to go through the required arbitration; (2) making some arbitral awards (i.e. those arising from disputes over small amount of compensation or working time, rest and holidays, and social insurances) final and binding to shorten the dispute resolution process; (3) extending scope of arbitrable matters to cover nearly all labor-related disputes; (4) extending the time limit for filing an arbitration case from 60 days to one year; (5) abolishing charge of arbitration fees; (6) putting heavier burden of proof on employers; (7) reducing arbitration hearing and award-making period from 97 to 60 days; and (8) clarifying jurisdiction of labor arbitration committees. However, this law does not significantly change the bewildering labor dispute resolution system that often fails to effectively protect workers' legal rights. In particular, most dispute cases still need to go through the long arbitration and litigation process. Although the law requires arbitral rewards be made within 60 days of the acceptance of the arbitration application, the ill-equipped arbitration committees do not have the capacity to meet this requirement. As a result, in the summer of 2008, many hearings of labor arbitration cases in cities such as Shenzhen and Shanghai were scheduled till the end of 2008 or even 2009.⁴⁷ In addition, the law does not increase the arbitration committees' autonomy; nor does it have better ways to improve the enforcement of arbitral awards and court verdicts.

All in all, although the labor law reform in 2008 imposes restrictions on certain

⁴⁷ Interviews with some officials of the Ministry of Human Resources and Social Security and the local labor bureaus in Shenzhen and Shanghai.

numerical flexibility practices especially illegal ones, the new laws do not significantly change the preconditions of numerical flexibility i.e. the contractual employment and loose legal environment. Therefore, increasing convergence of workplace employment practices toward numerical flexibility with Chinese characteristics is expected in the near future.

Table 1: Profiles of Case-Study Enterprises

Enterprise	Ownership	Founded Time	Major Products	Employment ^e	Turnover ^e (US\$1,000)	Profit ^e (US\$1,000)
A	SOE	1953	Cranes	3,276	343,890	26,554
B	SOE	2002	Truck-Mounted Cranes	358	14,038	65
C	Listed SOE ^a	1949	Loading Machinery Road building	1,485	189,403	-5,310
D	Listed SOE ^a	1948	and Compaction Machinery	2,172	196,141	-10,630
E	IJV ^b	1958	Axle	714	63,384	2,303
F	WFIE ^c	1996	Concrete Machinery	158	49,383	-400
G	POE ^d	1992	Excavators	247	17,441	251

Notes:

- C and D were affiliated to a state shareholding company listed in Shenzhen Stock Market in 1996.
- E was a SOE before it became a joint venture with a US auto parts company in 1996.
- F was founded as a Sino-Germany joint venture in 1996 and became a wholly German-owned enterprise in 2005.
- G was a SOE before it was privatized in 2001.
- Internal statistics of these enterprises at the end of 2005.

Table 2: Retrenchment in Case-Study Enterprises (2006)

	A	B	C	D	E	F	G
Termination of labor relationships (%)	1.1	2.1	1.6	0.4	4.3	6.6	7.4
Layoffs (accumulated, %)	2.4	1.9	0.7	1.3	0	0	0
Employees waiting for posts in the labor-pool (%)	0	0	1.4	3.4	NA	NA	NA
Early retirees (accumulated, %)	3.2	23.6	27.1	36.4	8.1	0	2.3
Total employment	3683	478	1403	2061	704	287	310

Sources: Enterprises' internal statistics.

Table 3: Numerical Flexibility in the Assembly Sub-plants/Workshops of Case-Study Enterprises

Numerical Flexibility	A	B	C	D	E	F	G
Workers without contracts & dispatched workers (%) ^a	0	0	9.5	0	6.1	24.9	5.1
Apprenticeship workers (%) ^a	4.7	15	15.2	3.3	5.6	6.1	52.6
Interns from technical schools (%) ^a	16.7	8.7	6.3	2.9	4.4	4.3	7.6
Three year (or less) labor contract (%)	80	38.5	86.8	27.5	56.7	96.6	77.8
Experience of laid-off (%)	2.3	5.0	17.4	0	38.7	3.1	15.8
Shift work (%)	11.9	92.5	97.8	80.4	83.9	75.8	31.6
Ave. overtime (hours/month)	43.2	72.2	71.4	25.6	46.8	42.7	50.2
Ave. overtime, peak (hours/month)	56.7	99.6	110.3	62.7	65.6	65.2	86.3
Job sharing (%)	39.5	45.0	23.9	69.4	20.0	42.4	50.0
Working in reduced time (%)	23.3	25.6	45.7	58.8	41.4	27.3	70.6

Notes: Calculations are based on worker surveys except for a, which are calculated from interviews with sub-plant/workshop managers.

Table 4: Functional Flexibility in the Assembly Sub-plants/Workshops of Case-Study Enterprises

Functional Flexibility	A	B	C	D	E	F	G
QC or other off-line teams (%)	55.8	32.5	23.9	17.6	38.7	3.0	0
Work in multiple sites (%)	30.2	2.6	10.8	16.3	16.2	12.1	5.3
Multiple tasks/responsibilities (%)	41.9	13.5	19.6	22.4	33.3	6.0	31.6
Two or more skills (%)	51.2	35.0	35.6	37.3	18.8	33.3	26.3
Teamwork ^a	some	no	no	no	no	no	no
Job rotation ^a	some	no	no	no	some	no	no
pay ^a	piece rates	piece rates	piece rates	piece rates	post + skill	post + annual bonus	piece rates

Notes: The data come from worker surveys except for a, which are based on interviews with sub-plant/workshop managers).

Table 5: Trade Unions in the Case-Study Enterprises

	A	B	C	D	E	F	G
Status of union chairman	full time, vice general manager treatment	part time, party secretary	full time, vice general manager treatment	part time, party secretary	part time, vice party secretary	part time, finance manager	part time, HR manager
No. of full time staff	5	0	1	0	2	0	0
Welfare and entertainment	yes	yes	yes	yes	yes, focus	limited	limited
Labor emulation	yes	yes	yes, focus	yes, focus	yes	no	no
Disciplinary inspection	yes, focus	yes	yes, focus	yes, focus	no	no	no
Workers' congress	once a year, focus	once a year	once a year	once a year	once a year	no	no
Information sharing	yes, focus	no	yes	yes	yes, limited	no	no
Collective contract	every 3 years	every 3 years	every 3 years	every 3 years	every 3 years	no	no
Wage agreement	no	no	no	no	yes	no	no
Labor dispute mediation	yes	limited	very limited	very limited	yes	no	no
Representing workers' interests	to certain extent	no	no	no	to certain extent	no	no
Workers satisfied with unions (%)	48.9	27.5	23.9	26.0	40.6	15.2	47.4

Sources: Interviews with enterprise union officials and workers' surveys.

Table 6: Accounts Receivable of the Case-Study Enterprises: 2004-2005

Enterprise	2004			2005		
	Sales Revenue	Receivables	Ratio (%)	Sales Revenue	Receivables	Ratio (%)
A	398071	21735	5.46	420743	20043	4.76
B	15885	748	4.71	11231	679	6.05
C + D ^a	377094	35706	9.47	308435	71067	23.04
E	61089	10289	16.84	52394	11177	21.33
F	42633	18111	42.48	20249	12641	62.43
G	6841	2232	32.63	NA	NA	NA

Source: Financial departments of the case-study enterprises.

Note: a. I only have combined data for C and D which formed a parent company.

Table 7: Manufactured Inventory of the Case-Study Enterprises: 2004-2005

Enterprise	2004			2005		
	Sales Revenue	Manufactured Inventory	Ratio (%)	Sales Revenue	Manufactured Inventory	Ratio (%)
A	398071	21411	5.38	420743	28506	6.78
B	15885	679	4.27	11231	751	6.69
C + D	377094	85358	22.64	308435	74431	24.13
E	61089	1265	2.07	52394	1227	2.34
F	42633	2187	5.13	20249	1393	6.88
G	6841	2295	33.55	NA	NA	NA

Source: financial departments of the case-study enterprises.

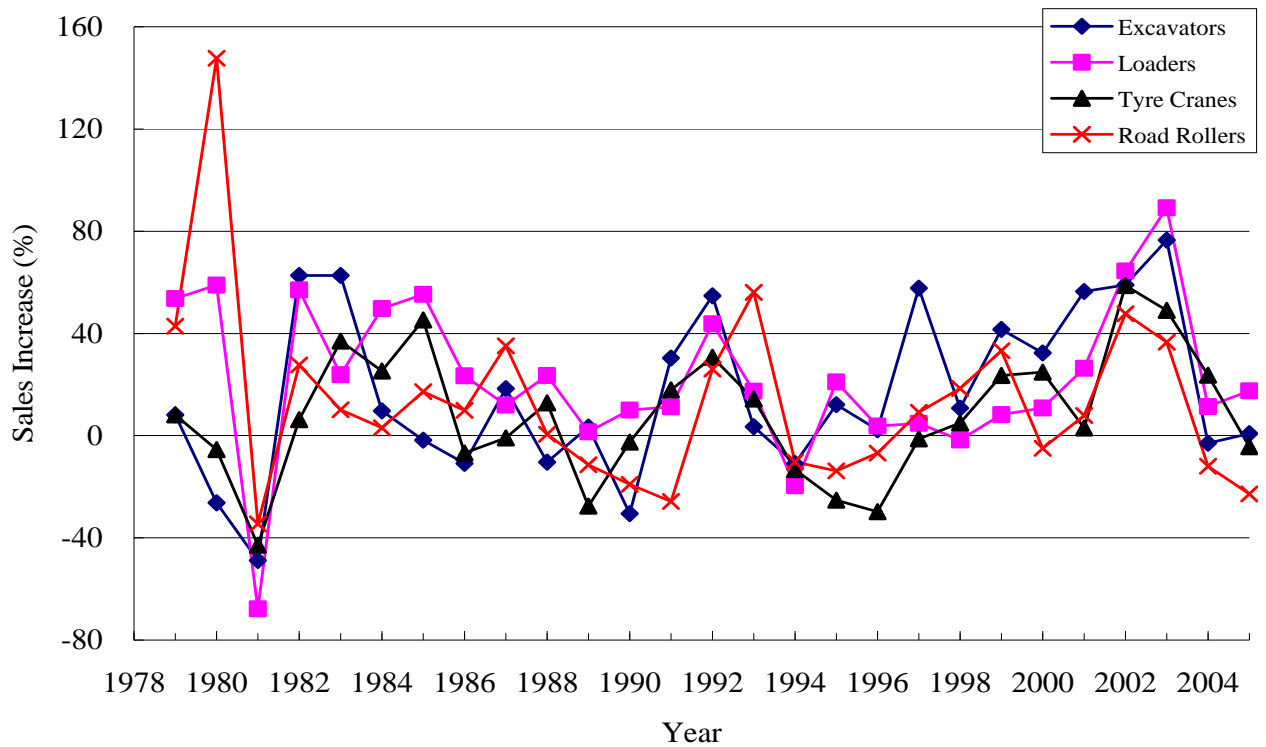
Note: a. I only have combined data for C and D which formed a parent company.

Table 8: Skills of Production Workers of the Case-Study Enterprises (June 2007)

	A	B	C	D	E	F	G
Elementary skilled workers and workers without grades (%)	22.64	41.12	24.52	31.08	56.13	52.17	50.48
Intermediate skilled workers (%)	61.13	45.69	50.88	57.28	30.52	42.75	47.62
Advanced skilled workers (%)	13.36	12.18	20.75	10.19	10.90	3.62	1.27
Technicians (%)	2.77	1.02	3.77	1.46	2.45	1.45	0.64
Senior technicians (%)	0.09	0	0.08	0	0	0	0
Total production workers	2133	197	1301	756	367	138	157

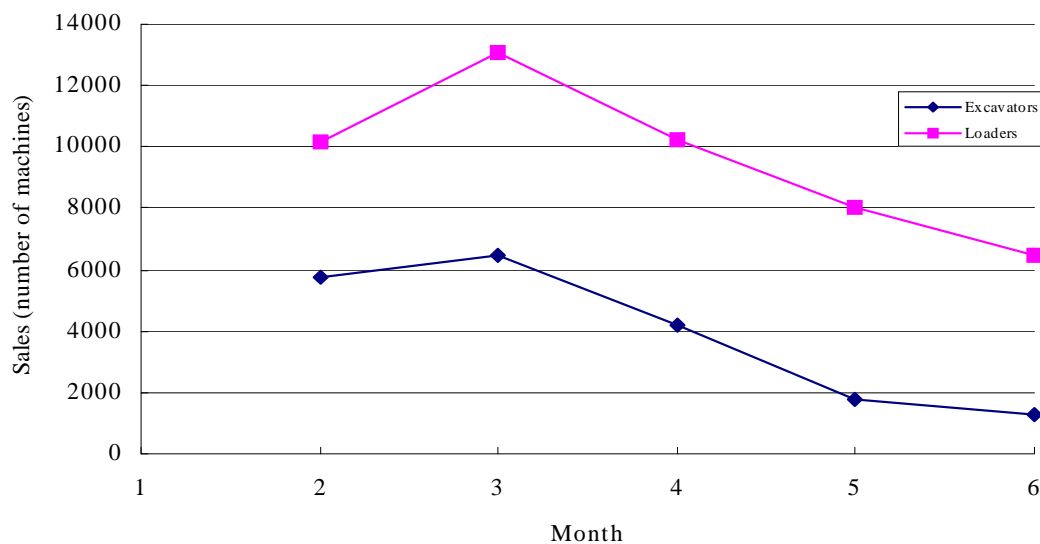
Source: Human resource departments of the case-study enterprises.

Figure 1: Sales Increases (%) of Four Major Construction Machinery Products: 1979-2005



Source: China Construction Machinery Industry Yearbook (2006) and Shi and Xu (2004).

Figure 2: Sales of Excavators and Loaders: February-June 2004



Source: Han (2005).

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